DISSERTATION ON

A COMPARATIVE STUDY BETWEEN CHLORHEXIDINE MOUTHWASH AND HYDROGEN PEROXIDE TO IMPROVE THE ORAL HEALTH OF BEDRIDDEN PATIENTS ADMITTED IN INSTITUTE OF NEUROLOGY DEPARTMENT AT RAJIV GANDHI GOVERNMENT GENERAL HOSPITAL, CHENNAI-03

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In Partial fulfillment of requirement for the degree of

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CERTIFICATE

This is to certify that this dissertation titled **"A comparative study between Chlorhexidine mouthwash and Hydrogen peroxide to improve the oral health of bedridden patients admitted in Institute of Neurology Department at Rajiv Gandhi Government General Hospital, Chennai-03"** is a bonafide work done by **Ms.VISHNU PRIYA.V**, College of Nursing, Madras Medical College Chennai-03 submitted to The Tamilnadu Dr.M.G.R. Medical University, Chennai in a partial fulfillment of the university rules and regulations towards the award of the degree of Master Science in Nursing Branch - I, Medical Surgical Nursing under our guidance and supervision during the academic period from 2010 - 2012.

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ABSTRACT

The impact of oral conditions on individual's quality of life can be profound. Bedridden patients and residents experience the same oro-dental problems as the general population, having said that, poor oral health may add an additional burden, whereas good oral health has real health gains in that it can improve general health, social acceptability, self-esteem and quality of life. The current study assessed the comparison of chlorhexidine mouth wash and hydrogen peroxide to improve the oral health of bedridden patients. The main aim of this study to compare the effectiveness of chlorhexidine mouthwash, and hydrogen peroxide to improve the oral health of bedridden patients.

The methodology used for this study was, quantitative, comparative research design- pretest post test control group design with 60 bedridden patients, 30 each group assigned by simple random sampling technique was conducted at Institute of Neurology, Rajiv Gandhi Government General Hospital, Chennai-03. Pre test was conducted using Semi- structured interview schedule to collect information on socio-economic demographic data and modified oral health assessment tool was used to assess the oral hygiene. Chlorhexidine and hydrogen peroxide used for oral care twice a day for seven days. Post test was conducted using the same questionnaire.

The findings of the study was, in chlorhexidine group, patients saw reduced score of 57.9%, whereas in hydrogen peroxide patients are saw reduced score of 33.8% in pain. The difference is 24.1%. Chlorhexidine patients were benefited than hydrogen peroxide patients. There was a significant difference between chlorhexidine and hydrogen peroxide group. The study was concluded that mouthwash with chlorhexidine which can be carried out by the patient or the relatives in their home and is economical. Since the prognosis of the neurological disease is delayed, chlorhexidine mouth wash improves the oral health of bedridden patients and prevents oral complications and promotes comfort of the patient.

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CHAPTER –I
INTRODUCTION

The quality of life is more important than life itself.

- Alexis carrel quotes

Oral care is important for patients' health and well-being for a variety of reasons which comprises of teeth, tongue, lips, gums et al, and as a whole termed as mouth. The mouth is vital for eating, drinking, taste, breathing, verbal and non-verbal communication. There is also saliva which has antibacterial properties and is part of the body's defense against infection. Poor oral hygiene is well known to be associated with painful and unpleasant diseases such as gingivitis, dental caries, halitosis and xerostomia and, more recently, has been linked to chest infections and pneumonia ***(Ministry of Health, 2004).***

However, the dental disease pattern and oral status is changing now. The general trend is for a reduction in edentulism and an increase in the retention of natural teeth until later life. Attitudes towards dental health are changing too, in such a way that tooth loss is considered less acceptable. The impact of oral conditions on individual's quality of life can be profound. Bedridden patients and residents experience the same oro-dental problems as the general population, having said that, poor oral health may add an additional burden, whereas good oral health has real health gains in that it can improve general health, social acceptability, self-esteem and quality of life.

Primary step for oral care is screening. Screening provides baseline data for planning dental services and oral health promotion strategies appropriate to patient's need. Oral assessment is recommended on admission to residential care using criteria which are client centered and which can be used by all grades of staff. An oral health assessment should be incorporated into routine assessment by care staff.

The influence of diet and nutrition on oral and general health are issues which must be addressed. Good nutrition can have a marked effect on the

health, happiness and independence of patients whereas the poor oral status of institutionalised older people may contribute to eating problems, weight loss, dehydration and debility. Basic principles of good infection control should be practiced by all health care professionals involved in oral care. The routine wearing of gloves for mouth care and handling dentures may help to over come aversion reported by health care professionals.

There are many issues that need to be addressed in improving standards of oral health and quality of life for bedridden patients in continuing care, guidelines for oral health must focus on the needs and demands of bedridden patients, be non –discriminatory in practice and based on the principles of equal access to oral care, information and services regardless of financial or other constraints. One of them is persistent bleeding of gum, for this persistent cause of bleeding; a mouth rinse called chlorhexidine can be prescribed. It is the most effective mouthrinse for removing plaque and fighting gingivitis. It has a solution of Chlorhexidine that controls the growth and kills the bacteria, which causes gum disease.

Free of man-made chemicals and artificial sweeteners found in most mouth rinses, Hydrogen Peroxide Mouthwash is a safe alternative to popular brands of antiseptic mouthwashes. Hydrogen Peroxide in low concentrations has many medical uses, and can work well as a mouthwash especially for small injuries within the mouth.

Dental plaque biofilms are colonized by respiratory pathogens in prolong bedridden patients. The goal of this study was to determine the minimum frequency (once or twice a day) for chlorhexidine gluconate application necessary to reduce oral colonization by pathogens. Nosocomial pneumonia is a significant cause of in-hospital morbidity and mortality. Oral care interventions have great potential to reduce the occurrence of nosocomial pneumonia. The use of chlorhexidine for oral care would reduce the incidence of nosocomial pneumonia.

1.1. NEED FOR THE STUDY

In Institute of Neurology department many bedridden patients are admitted and they developed oral complications. Oral problems like oral ulcer, bleeding, sticky saliva, fissured teeth, coated tongue which develops respiratory problems like nosocomial infection and also they are more prone to get oral infections. Here in the institute of neurology oral care is provided by using normal saline and occasionally hydrogen peroxide. Normal saline is regularly used in oral care for bedridden patient in Institute of Neurology department. Though normal saline is used for oral care, there are many other mouth wash solutions available which are more effective than normal saline. To improve the oral health of bedridden patients in an effective way chlorhexidine mouth wash can be used. Most frequently, bedridden patients get naso gastric feed and the attention for oral care is not carried out effectively. In addition to this, poor nutritional state, immobility etc, lead to other co- morbidity diseases to be more prone to occur

Statistics of bedridden patient in Institute of Neurology Department at Rajiv Gandhi Government General Hospital

S. No	Year	Patients/ year	Bedridden
1.	2009	2116	701
2.	2010	2067	750
3.	2011	3092	841

The above status shows that the bedridden patients number increased every year. The care and treatment varies and hospital stay also increased. Oral health plays a vital role with the modified mouth wash solution to protect the patient from oral infection and also reduce the hospital stay

In Rajiv Gandhi Government General Hospital, Institute of Neurology Department functions separately.They require more attention and comprehensive care. The researcher observed during her ward posting that, the oral care for bedridden patients were carried out without ward sisters (nurses). So the researcher expressed the intention to do the study to

implement new solution for oral care to prevent oral infection. These interventions help the patient to improve the oral health status and prevent oral and respiratory complications and also promotes the comfort of the patient.

Lancashire P (2002) conducted study on 'The oral hygiene and gingival health of paraplegic inpatients a cross sectional survey'. Physical and or mental handicaps are known to directly or indirectly compromise hygiene habits including oral hygiene. It is recommended in the case of handicapped patients, that their parents or care workers require from an early stage dental health education and active involvement in preventive programmes. This study surveyed the oral hygiene of paraplegic patients in a specialised centre to determine their oral hygiene needs. Most patients had moderate to poor oral hygiene and gingivitis was prevalent and severe. Plaque and gingivitis was increased in quadriplegic compared to hemiplegic patients. The data indicate that as part of rehabilitation of paraplegic patients there is a need for oral hygiene programmes to be established.

Van den Broke Am et al (2006) conducted study on 'A review of the current literature on management of halitosis'. Halitosis is an unpleasant or offensive odour, emanating from the oral cavity. In approximately 805 of all cases, halitosis is caused by microbial degradation of oral organic substrates. Major degradation products are volatile sulphur- containing compounds. In this review, the available management methods being plenty but, undoubtedly, the basic management is mechanically reducing the amount of micro- organisms and substrates in the oral cavity. Masking products were found to be not very effective and antimicrobial ingredients in oral healthcare products are only temporary effective in reducing micro- organisms or their substrates. Good short term results were reported with chlorhexidine.

Bellissimo-Rodriges F et al conducted study of 'Effectiveness of oral rinse with chlorhexidine in preventing nosocomial respiratory tract infections, in intensive care unit patients'. The study design was a double blind, randomized, placebo-controlled trail. Oral rinsed with chlorhexidine or a placebo where performed two times a day throughout the duration of the patient's stay in the hospital. Oral

application of a 0.12% solution of chlorhexidine does not prevent respiratory tract infections among ICU patients, although it may retard their onset.

Another significant use of mouthwashes is to reduce halitosis. Oral malodour is multifactorial in its origins but a main cause is metabolic products from bacteria residing in bacterial plaque, on the tongue or present in saliva. Mouthwash containing chlorhexidine is beneficial in the management of oral malodour and reduce levels of bacteria. Chlorhexidine has been used successfully to ensure maintenance of gingival health around dental implants and reduce bacteria.

Thus the researcher intended to provide oral care for bedridden patient's of neuro ward to prevent infection, reduce the respiratory complications and promote comfort of the paitent.

1.2 STATEMENT OF THE PROBLEM

A comparative study between chlorhexidine mouthwash and hydrogen peroxide to improve the oral health of bedridden patients admitted in Institute of Neurology Department at Rajiv Gandhi Government General Hospital, Chennai-03.

1.3. OBJECTIVES:

- Assess the level of oral health of bedridden patients before the intervention for both the group of patients
- Assess the effectiveness of chlorhexidine mouth wash to improve the oral health of bedridden patients
- Assess the effectiveness of hydrogen peroxide to improve the oral health of bedridden patients
- Compare the effectiveness of chlorhexidine mouthwash, and hydrogen peroxide to improve the oral health of bedridden patients
- Associate the effectiveness of chlorhexidine mouth wash with selected demographic variables

1.4OPERATIONAL DEFINITION

Oral health:

Oral hygiene is the practice of keeping the mouth clean and healthy by brushing and flossing to prevent tooth decay and gum disease.

Chlorhexidine:

Chlorhexidine is a chemical antiseptic. It is effective on both Gram-positive and Gram-negative bacteria. It is also useful against fungi and enveloped viruses, though this has not been extensively investigated.

Bedridden Patient:

An individual from any age group confined to bed for prolong time.

Hydrogen peroxide:

Is an oxidizing agent, clear liquid, slightly more viscous than water. With its oxidizing properties, hydrogen peroxide is used as a bleach or cleaning agent.

1.5. HYPOTHESIS

- There is a significant improvement in oral health of bedridden patient by using both chlorhexidine mouth wash and hydrogen peroxide solution.
- There is a significant difference between chlorhexidine mouth wash and hydrogen peroxide solution in improving the oral health of bedridden patient

1.6. ASSUMPTION

- Oral care promotes comfort of the patient.
- Bedridden patients will develop oral complications.
- Hydrogen peroxide improves the oral health of bedridden patient.
- Chlorhexidine mouth wash improves the oral health of bedridden patient than hydrogen peroxide.

1.7. DELIMITATIONS

- The study is limited to conscious bedridden patients.
- The study was limited to only one hospital, Institute of Neurology Department, Rajiv Gandhi Government General Hospital, Chennai-03.
- The study was restricted to a period of one month.
- Only 60 patients were taken for this study.

CHAPTER-II
REVIEW OF LITERATURE

2.1. REVIEW OF RELATED STUDIES:

The purpose of review of literature is to obtain comprehensive knowledge and in depth information about importance of oral hygiene for bedridden patient. An extensive review of literature related to chlorhexidine mouthwash and hydrogen peroxide were done to gain insight and greater understanding into the problem under study and collect maximum information for laying the foundation of the study.

This chapter consists of four sections

- Section A – literature related to importance of oral care for bedridden patients.
- Section B- literature related to effectiveness of chlorhexidine mouth wash.
- Section C – literature related to effectiveness of hydrogen peroxide.
- Section D – literature related to comparative study between chlorhexidine mouthwash and hydrogen peroxide solution.

SECTION A- LITERATURE RELATED TO IMPORTANCE OF ORAL CARE FOR BEDRIDDEN PATIENTS

Oral hygiene is undervalued in terms of its effects on patient health and nutrition. Effective oral care reduces infection and promotes health. This article explores the evidence for appropriate assessment of oral health and provides guidance for effective oral care.

Bundesgessundhei Itsblatt, et al (2009) conducted study on oral hygiene in nursing home residents. Impact of an oral health education programme for the nursing personnel on the residents' oral health. This programme was evaluated by examining the oral and dental health status of the residents, prior to and up to 12 months after the hygiene education. Within

the 4 months, 29 of 57 residents with recommendations for dental therapy had been seen by the dentist, 12 months after the first examination, dental therapy had to be recommended to only 19 residents. Education of the nursing staff in nursing homes is effective in improving oral health of the residents. Therefore, all residential homes will be offered regular and free education programmes in health for their personnel.

Van den Broke AM, et al (2006) conducted study on A review of the current literature on management of halitosis. Halitosis is an unpleasant or offensive odour, emanating from the oral cavity. In approximately 805 of all cases, halitosis is caused by microbial degradation of oral organic substrates. Major degradation products are volatile sulphur- containing compounds. In this review, the available management methods of undoubtedly, the basic management is mechanically reducing the amount of micro- organisms and substrates in the oral cavity. Masking products were found to be not very effective and antimicrobial ingredients in oral healthcare products are only temporary effective in reducing micro- organisms or their substrates. Good short term results were reported with chlorhexidine.

Montal S, et al (2005) conducted study on oral hygiene and the need for treatment of the dependent institutionalised elderly, a cross sectional study of 321 elderly patients was conducted at several geriatric services of Montpellier, France. The clinical evaluation dental status was recorded together with medical information. Dental and prosthetic hygiene, status of dentures, caries experience, dependence conditions and treatment needs were evaluated, the prevalence of edentulism was relaitvely low, while the need for prosthodontic rehabilitation, especially for men, was still very high. The dental hygiene was globally inadequate. This evaluation emphasis the care demand and the need for help in oral hygiene procedures for the dependent institutionalised elderly.

Lancashire P (2002) conducted study on the oral hygiene and gingival health of paraplegic inpatients a cross sectional survey. Physical and or mental handicaps are known to directly or indirectly compromise hygiene

habits including oral hygiene. It is recommended for handicapped patients, that, their parents or care workers require from an early stage dental health education and active involvement in preventive programmes. This study surveyed the oral hygiene of paraplegic patients in a specialised centre to determine their oral hygiene needs. Most patients had moderate to poor oral hygiene and gingivitis was prevalent and severe. Plaque and gingivitis was increased inn quadriplegic compared to hemiplegic patients. The data indicate that as part of rehabilitation of paraplegic patients there is a need for oral hygiene programmes to be established.

Chin J Dent Res (2000) conducted study on a study of oral health condition in individuals with no oral hygiene and its association with plaque acidogenesis. The objective of the study was to study the association of long term deposited plaque, due to lack of oral hygiene, with acidogenesis of the plaque bacterria. 77 subjects with poor oral hygiene were selected. Among them 16 were comprised caries active, 27 were caries free, comprised the caries free group. Long term deposited plaque due to lack of oral hygiene may have less cariogenic capability, although patients' susceptibility to periodontal disease would increase.

SECTION –B: LITERATURE RELATED TO EFFECTIVENESS OF CHLORHEXIDINE MOUTH WASH

Tantipong H, et al(2007) conducted study on randomized controlled trail and meta-analysis of oral decontamination with 2% chlorhexidine solution for the prevention of ventilator-associated pneumonia. The patients were randomized to receive oral decontamination with 2% chlorhexidine solution or normal saline solution until their endotracheal tubes were removed. The outcomes measures were the development of VAP and oropharyngeal colonizatiol with gram-negative bacilli. The characteristics of the patients in the chlorhexidine group (n=102) and the normal saline group (n=105) were not significantly different. Oral decontamination with 2% chlorhexidine solution is an effective and safe method for preventing VAP in patients who receive mechanical ventilation.

Kolahi J, Soolari (2006) conducted study on rinsing with chlorhexidine gluconate solution after brushing and flossing teeth. The objective of this study was to discuss the concept of delaying the use of chlorhexidine mouthrinse (CHX) until sometime after the use of dentifrice. A 30 minutes interval of CHX rinsing gave a significantly reduced antiplaque effect of CHX. In regard to tooth staining by CHX mouth rinses, use of dentifrice before CHX showed a reduction in staining of 18%, whereas CHX followed by dentifrice showed a reduction in staining of about 79%. To optimize the antiplaque effect of CHX, it seems best that the interval between tooth brushing and rinsing with CHX be more than 30 minutes, cautiously close to 2 hours after brushing.

Menendez (2005) conducted study on antibacterial effects of chlorhexidine mouthwash on Streptococcus mutants. Chlorhexidine has been proposed as a potent chemotherapeutic agent against oral bacteria. The purpose of this study was to investigate the effectiveness of chlorhexidine oral rinses to reduce S. mutants levels in human saliva. Sixteen healthy adult subjects were randomly assigned to one of four rinse groups using a 4-cell crossover design. The groups rinsed twice a day for 7 days with one of the following: chlorhexidine, hydrogen peroxide, a combined chlorhexidine + hydrogen peroxide, or water (control).
No significant differences were seen in S. mutants levels among the groups; however, the levels of total streptococci on day 7 samples were significantly lower in the chlorhexidine and chlorhexidine + hydrogen peroxide groups than in the hydrogen peroxide and control groups. There was no additional decrease seen in S. mutants or total streptococci levels in the group receiving chlorhexidine + hydrogen peroxide compared to chlorhexidine alone. Adding hydrogen peroxide to the chlorhexidine mouthrinse did not result in a further decrease in S. mutants levels.

Bellissimo-Rodriges F, et al(2005, conducted study of effectiveness of oral rinse with chlorhexidine in preventing nosocomial respiratory tract

infections, intensive care unit patients'. The study design was a double blind, randomized, placebo-controlled trail. Oral rinsed with chlorhexidine or a placebo where performed two times a day throughout the duration of the patient's stay in the hospital. Oral application of a 0.12% solution of chlorhexidine does not prevent respiratory tract infections among ICU patients, although it may retard their onset.

Mary Jo Grap, et al(2004) performed study on **e**arly oral application of chlorhexidine on oral microbial flora in bedridden patient. The purpose of this study was to describe the effect of an early post-intubation oral application of chlorhexidine gluconate on oral microbial flora to bedridden patient. Thirty-four patients were randomly assigned to chlorhexidine gluconate by spray or swab or to control group. Oral cultures were done at study admission, 12, 24, 48, and 72 hours, whereas the Clinical Pulmonary Infection Score (CPIS) was documented at study admission, 48, and 72 hours. Reductions in oral culture scores (less growth) were only found in the treatment groups (swab and spray); no reduction was found in the control group. There was a trend for fewer positive cultures in the combined treatment groups. The mean CPIS for the control group increased to a level indicating pneumonia (4.7 to 6.6), whereas the CPIS for the treatment group increased only slightly (5.17 to 5.57). Trends in the data suggest that use of chlorhexidine gluconate in the early period may mitigate or delay the development of microbial flora in bedridden patient.

Peridex, Zila (2003) conducted study on chlorexidine (CHX) and essential oil (EO) mouthwash. CHX has a strong affinity for tooth and tissue surfaces. Patients must also wait until all traces of toothpaste are removed before rising with CHX. Long-term use of an EO mouthwash is microbiologically safe, with no changes observed in the bacterial composition of supragingival plaque, and no evidence of antimicrobial resistance. A number of trails have demonstrated the long-term plaque and gingivitis-reducing properties of both CHX and EO mouthwashes. These studies clearly demonstrate that these agents have lasting efficacy and can access hard-to-reach areas.

In the year 2003 Becerik S, et al conducted study on antimicrobial effect of adjunctive use of chlorhexidine mouth rinse in untreated gingivitis: a randomized, placebo- controlled study. The aim of this study was to examine the effectiveness of chlohexidine mouth rinse. Chlorhexidine group rinsed with 0.2% chlorhexidine, while placebo group rinsed with placebo mouth rinse. In the chlorhexidine group the total bacteria count is significantly reduced in posterior teeth ($p<0.05$), while no significant decrease was observed in the placebo group ($p>0.05$). chlorhexidine as an adjunct to daily plaque control could be used in the management of plaque associated gingivitis and in reducing the sub gingival total bacteria count especially in posterior teeth.

Sari E, Birinci I(2002), conducted study on 0.2% chlorhexidine gluconate mouth rinse in orthodontic patients. The objective of the study was to assess the effectiveness of 0.2% chlorhexidine gluconate mouth rinse on Streptococcus mutants and lactobacilli in orthodontic patients with fixed appliances. Twenty patients, aged 20-18, with fixed orthodontic appliances participated in the study. The levels of S. mutants and lactobacilli in saliva samples were evaluated in four stages. 1 week after the introduction of chlorhexidine gluconate mouth rinse, and at the fourth week. The changes in S mutants and lactobacilli levels were analyzed via Wilcoxon test. The result was a significant decrease in S mutants levels was observed 1 week after the introduction of chlorhexidine mouth rinse. They concluded that a chlorhexidine gluconate mouth rinse decreased S mutants' levels, but had no effect on lactobacilli levels.

Baylas H, et al(2002) conducted study on effect of adjunctive chlorhexidine mouth rinse on clinical parameters and gingival crevicular fluid cytokine levels in untreated plaque associated gingivitis. 50 gingivitis patients were randomized to chlorhexidine or placebo groups. Chlorhexidine group rinsed with chlorhexidine, while placebo group rinsed with placebo mouth rinse for four weeks. Within the limitations of this study, chlorhexidine mouth rinse as adjuncts to daily plaque control could be useful in management of plaque associated gingivitis.

Soares CJ, et al(2001) conducted study of effects of chlorhexidine and fluoride on irradiated enamel and dentin. The effectiveness of mouth wash protocols in preventing gamma irradiation therapy damage to the Ultimate Tensile Strength (UTS) of enamel and dentin is unknown. It was hypothesized that the use of chlorhexidine and fluoride mouthwash would maintain the UTS of dental structures. One hundred and twenty teeth were divided into 2 groups. The specimens were evaluated by microtensile testing. Mouthwash with 0.12% chlorhexidine partially prevented the damage to the mechanical properties of the irradiated crown dentin, whereas the 0.05% sodium-flouride-irradiated enamel showed UTS similar to that of non-irradiated enamel.

Vollmer WM, et al(2000) conducted study on effect of chlorhexidine for the prevention of adult caries. Dental caries is one of the primary causes of tooth loss among adults. The Prevention of Adult Careis Study (PACS) is a multicenter, placebo-controlled, double blind, randomized clinical trial of the efficacy of a chlorhexidine dental coating in preventing adult careis. The cause effectiveness analysis also will be considered. This new dental treatment, if efficacious and approved for use by the food and drug administration (FDA), would become new in-office, anti microbial agent for the preventional of adult careis in the United States.

In the year 2000,effectiveness of 0.12% chlorhexidine gluconate oral rinse in reducing prevalence of nosocomial pneumonia in unconscious patients was conducted**.** The objective of the study was to test the effectiveness of 0.12% chlorhexidine gluconate oral rinse in decreasing microbial colonization of the respiratory tract and nosocomial pneumonia in unconscious patients .

A prospective, randomized, case-controlled clinical trial design was used. Peridex (0.12% chlorhexidine gluconate) was the experimental drug, and Listerine (phenolic mixture) was the control drug. A total of 561 patients were selected and were randomized to an experimental (n = 270) or a control

(n = 291) group. Nosocomial pneumonia was diagnosed by using the criteria established by the Centers for Disease Control and Prevention. The overall rate of nosocomial pneumonia was reduced by 52% (4/270 v/s 9/291; P = .21) in the Chlorhexidine treated patients. Among patients intubated for more than 24 hours who had cultures that showed microbial growth (all pneumonias occurred in this group), the pneumonia rate was reduced by 58% (4/19 v/s 9/18; P = .06) in patients treated with Peridex. In patients at highest risk for pneumonia (incubated > 24 hours, with cultures showing the most growth), the rate was 71% lower in the chlorhexidine group than in the Listerine group (2/10 v/s 7/10; P = .02). Although rates of nosocomial pneumonia were lower in patients treated with Peridex than in patients treated with Listerine, the difference was significant only in those patients intubated more than 24 hours who had the highest degree of bacterial colonization

Duarte Fde F, et al(2000) conducted study on local delivery of chlorhexidine gluconate in patients with aggressive periodontitis. Eleven consecutive patients with aggressive periodontitis were recruited for this study. Two sites received Scaling and Root Planning (SRP) and placement of the chlorhexidine chip, and the other two sites received scaling and root planning only. The authors concluded that the adjunctive use of the biodegradable chlorhexidine chip resulted in greater reduction of periodontal pocket depth (PPD) in patients with aggressive periodontitis when compared to scaling and root.

Weitz M, et al (1992) done study on effect of a twice daily chlorhexidine rinse on the oral health of geriatric population. The inhibitory effect of a chlorhexidine rinse on gingival inflammation and plaque accumulation has been well documented. The purpose of this study was to determine whether a twice daily oral rinse with chlorhexidine will resolve denture associated inflammation in a geriatric population. Thirty six subjects were randomly divided into two groups, active and control. The subjects, following baseline measurements, were required to rinse twice daily for 30 seconds with either a 15 ml solution of chlorhexidine or a placebo and instructed to continue their normal oral hygiene routine. The data were

statistically analyzed. When active and control groups were compared, wither in total or within their stratified subdivisions, significant differences were observed (P< 0.001). The active group had a 10.27 and 16.68% reduction in the gingival and plaque indexes, respectively, compared to insignificant changes in the control groups. It was concluded that although chlorhexidine proved effective in reducing inflammation and plaque scores, this reduction was not influenced by the type of prosthesis worn.

SECTION C: LITERATURE RELATED TO EFFECTIVENESS OF HYDROGEN PEROXIDE

Hossainian N (2011) conducted study on the effects of hydrogen peroxide mouthwashes on the prevention of plaque and gingival inflammation. The purpose of this review was to describe systematically the effects of hydrogen peroxide mouthwashes as an adjunct to daily oral hygiene or as a monotherapy in the prevention of plaque accumulation and gingival inflammation. Independent screening of titles and abstracts of 229 articles resulted in 10 publications that met the criteria for eligibility. Descriptive comparisons are presented for hydrogen peroxide mouthwash as compared with control mouthwashes or no oral hygiene. Mean values and standard deviations were obtained by data extraction. Based on a quality assessment, three studies, of which one evaluated H2O2 over a period of 6 months, were considered to represent a low risk of bias. This 6 month study showed a positive effect of the use of H2O2 on the modified gingival index. The results of the studies included in this review showed that H2O2 mouthwashes do not consistently prevent plaque accumulation when used as a short term mono therapy. When used as a long term adjunct to daily oral hygiene, the results of one study indicate that oxygenating mouthwashes reduce gingival redness.

Yudhira R (2007) conducted study on Clinical trial of tooth whitening with hydrogen peroxide whitening strips and two whitening dentifrices. The purpose of the study was to compare tooth whitening with hydrogen peroxide whitening strips and two whitening dentifrices in a 3 weeks randomized controlled trial at a Belgian dental school. Subjects received either the hydrogen peroxide whitening strips (crest whitestrips) and

an anticavity toothpaste (Crest Cavity Protection), placebo strips and a Sodium Fluoride (NaF) whitening dentrifrice (Mentadent Whitening Toothpaste) or placebo strips and a sodium monofluorophosphate (MPF) whitening dentifrice (Rembrandt Low Abrasion Whitening Toothpaste). Strip use (peroxide placebo) was for 30 minutes, twice daily for 3 weeks. All subjects completed the 3 week evaluation. Between group comparisons demonstrated significant ($P < 0.0001$) versus either of the continuously used whitening dentifrices. There were no significant ($P > 0.18$) differences between the whitening dentifrice groups at any time points. All treatments were well tolerated, with minor tooth sensitivity and oral irritation representing the most common findings.

Hasturk H (2004) done study on a randomized clinical trial was performed to test the efficacy of a fluoridated hydrogen peroxide based mouthrinse on gingivitis. A total of 99 subjects were included in the study and were randomly assigned to receive either placebo or test mouthrinse. Clinical measures were chosen to reflect the gingival health and tooth whiteness in an intent to treat study design. Baseline differences between the groups were adjusted. Microbial samples taken at the beginning and at the end of the study were analyzed by DNA- DNA hybridization technique, to determine whether there was any adverse shift in supragingival flora. Eastman bleeding index, modified gingival index, intensity of stain, and extent of stain were significantly reduced in the test group to baseline ($P < 0.05$). In contrast, only the Eastman bleeding index was significantly reduced in the control group ($P< 0.05$). The reduction in the index of gingival inflammation for the test group was significantly greater than for the control group ($P=0.004$). The results of this study indicate that the fluoridated hydrogen peroxide based mouth rinse effectively whitens teeth and significantly reduces gingivitis.

Grigor J, Roberts AJ (1992) did a study on reduction in the levels of oral malodour precursors by hydrogen peroxide'. The potential of hydrogen peroxide to reduce the levels of salivary thiol precursors of oral malodour was investigated in- vitro and in-vivo. The efficacy of a fluoride containing test toothpaste also containing hydrogen peroxide and sodium bicarbonate was

evaluated in a crossover study using ten male and female subjects. All subjects used the test product and a control fluoride dentifrice, in a random order. Subjects brushed for 1 minute with 1.50 (+/- 0.05)g test or control paste and generated another saliva sample as before, 30 minutes after product application. Using the same analytical procedures the mean(+/- SEM) percent reduction in salivary thiol levels post treatment compared to baseline was found to be 59.0(+/- 7.0)% for the test product compared with 12.5 (+/-5.2%) for the fluoride control paste.

Fischman, et al (1992) have done study on the laboratory and clinical safety evaluation of a dentifrice containing hydrogen peroxide. This study reports the laboratory, and microbiological finding of the safety testing and daily use of a dentifrice delivering 0.75% hydrogen peroxide. Laboratory studies using Ca45 labeled teeth and biologically stained teeth confirmed that the dentifrice did not decalcify enamel or bleach teeth. Over the course off a six month period, 62 subjects using a hydrogen peroxide dentifrice and 21 subjects using a control dentifrice were examined for oral soft tissue change and hard tissue alterations. No soft tissue changes attributable to the use of either dentifrice were noted. Experienced clinicians using Trybute shade guide teeth observed no significant changes to the subjects' anterior teeth following 6 months use of the test dentifrice. Paired discrimination tests revealed that the examiners could distinguish color differences in the shade guide teeth at 0.7%. Microbiological monitoring of the subjects for six months use of their assigned dentifrice and for the following months on the control dentifrice, revealed neither an increased incidence of candida nor increased candida counts.

SECTION D: LITERATURE RELATED TO COMPARATIVE STUDY BETWEEN CHLORHEXIDINE MOUTHWASH AND HYDROGEN PEROXIDE

Senol G, et al (2007) performed study on in vitro antibacterial activities of oral care products against hospital acquired pneumonia pathogens. The objective of the study was to detect and compare in vitro antibacterial activities of three oral care products against hospital acquired

pneumonia pathogens. Stabilized hydrogen peroxide 0.2% chlorhexidine glconate and commercial product including glucose oxidase, lactoperoxidase, lysozume, and lactoferrin were selected for this study. In all dilutions and methods, antibacterial activity of chlorhexidine and hydrogen peroxide were found more effective than other products against hospital acquired pneumonia pathogens. They concluded chlorhexidine and hydrogen peroxide have good antibacterial effects against most isolated HAP pathogens in vitro. They could be suggested as oropharyngeal decontamination agents for reducing hospital acquired pneumonia incidence.

Article by Korf M (2003) related to Studies on oral hygiene and periodontal prophylaxis in patients with jaw fractures. Oral hygiene experiments with hydrogen peroxide and chlorhexidine rinsing were performed in 15 patiens with dental splints for jaw fractures and intermaxillary wiring. To measure the various cleaning measures, plaque index was determined at the 7th, 21st, and 35th postoperative days. The chlorhexidine gluconate was always by far superior to hydrogen peroxide as far as plaque inhibition was concerned. With chlorhexidine plaque reduction up to 69% and hydrogen peroxide reductions up to 22% were observed. After a test period, only slight side effects were recorded, such as discolorations at the lingual side of the teeth and in few cases bad taste or dark coating of the tongue.

Gusberti FA, et al (2002) conducted study on microbiological and clinical effects of chlorhexidine digluconate and hydrogen peroxide mouthrinses on developing plaque and gingivitis. While the ability of chlorhexidine to prevent plaque formation and inhibit the development of gingivitis has been well documented in the literature, the therapeutic value of hydrogen peroxide in preventing gingivitis is in dispute. The purpose of this study was to compare the clinical and microbiological effects of an established therapeutic agent, such as chlorhexidine with that of hydrogen peroxide in the experimental gingivitis mode. Following a period of stringent oral hygiene, 32 subjects were allocated to 1 of 3 treatment groups which were balanced on the basis of their pre experimental gingivitis scores. At the

end of the experimental period, the group rinsing with chlorhexidine showed 95% reduction in plaque scores compared to the group rinsing with placebo. Conversely, the group using hydrogen peroxide showed a marginal reduction in gingivitis incidence of 15% and a 28% reduction in bleeding sites compared to the placebo group, but no significant reduction in plaque scores. The microbilogical results showed that chlorhexidine was an excellent broad spectrum antimicrobial agent which significantly reduced the number of both facultative and obligate anaerobes in plaque.

Glockmann (2000) found antibacterial efficiency and toxicity of hydrogen peroxide and other antiseptics. The results suggest a relatively favourable relation between minimum bactericidal concentration and toxic agent concentration of hydrogen peroxide in comparison with chlorhexidien digluconate, sodium tosylchloramide and peractic acid. For chlorhexidine digluconate a somewhat more favourable relation between minimum bacteriostatic and toxic concentration of the agent was established.

Dona BL (1998) conducted study on the inhibitory effect of combining chlorhexidine and hydrogen peroxide on 3- day plaque accumulation. In a blind, randomized, 4-cell, cross over study, the effect of rinsing with a perborate solution on the in vivo plaque inhibiting effect of 0.12% chlorhexidine was examined. After a thorough professional prophylaxis including interdental cleaning, 12 subjects to rinse according to 4 different regimens. After 72 hours, the subjects were scored for plaque, and a washout period of 4 days followed. Cross over was randomly assigned according to a latin square design. Following this procedure, all subjects went through all 4 regimens. The results suggest a positive interaction between chlorhexidine and hydrogen peroxide. Rinsing with a combination of 0.12% chlorhexidine and peroxide solution can result in more effective short term plaque growth inhibition than rinsing with chlorhexidine alone.

2.2 CONCEPTUAL FRAMEWORK

The present study aims to compare the chlorhexidne mouthwash and hydrogen peroxide to improve the oral health of bedridden patient. The conceptual framework for the study was derived from the general system theory. Ludwig Von Bertalanlly described this theory in the late 1930's.

According to this theory a system is a set of inter related parts that come together to form a whole. Real systems are open and interact with their environment and they can produce change. This theory describes how to break whole things in parts and then learn how the parts work together in the system. A change in only one of the elements must produce change in all the others.

FUNCTIONING OF THE SYSTEM

The system function as

INPUT

The first is input which is the information, energy or matter that enters the system. For a system to work well the input should concentrate in achieving the purpose of the system.

In this study, the Input process includes the demographic variable like age, sex, education, occupation, religion, diet pattern and marital status. Clinical variables like cause of illness, length of hospital stay, duration of illness. Pre intervention assessment of oral health done by using modified oral health assessment tool which consist of question regarding lips, tongue, gums, teeth, pain.

THROUGHPUT

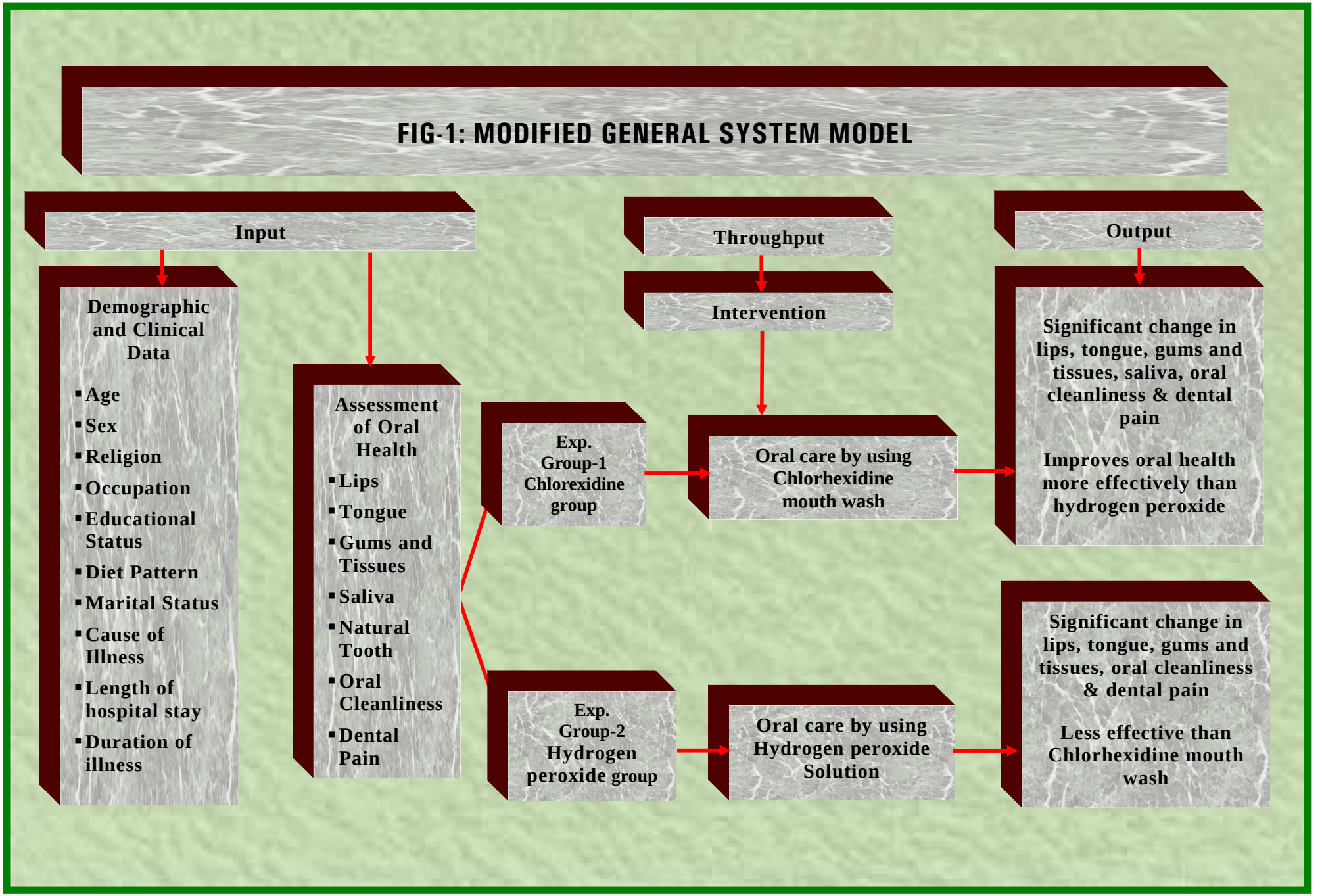
According to the theorist, throughput refers to the process used by the system to convert raw material or energy from the environment into products that are usable by the system itself or by the environment.

In this active process, the researcher convert the energy by using chlorhexidine mouthwash and hydrogen peroxide solution and oral care given and assessed the oral health of bedridden patient.

OUTPUT

According to the theorist it refers to the product or service which results from the systems throughput. Output in this study refers to the end product of the system reduction in the swelling, haemorrhage, pain, sticky saliva, ulcers coated tongue and improvement of oral health. Improvement of oral health of bedridden patient is more effective by using chlorhexidine mouthwash than hydrogen peroxide solution.

FIG-1: MODIFIED GENERAL SYSTEM MODEL



CHAPTER-III
METHODOLOGY

This chapter explains the research methodology adopted for this study. Research methodology is a way to systematically solve the research problem. The methodology of the investigation is of vital importance. The methodology of research indicates the general pattern of organizing the procedures it gathers valid and reliable data for the problem under investigation. The present study was aimed to assess the Comparative Study between Chlorhexidine Mouthwash and Hydrogen Peroxide to Improve the Oral Health of Bedridden Patients Admitted in Institute of Neurology Department At Rajiv Gandhi Government General Hospital, Chennai-03.

This chapter deals with description of methodology and different steps which are undertaken for collecting and organizing data for investigation include Research Approach and Research Design, Settings, Population, Sampling, Criteria, Sampling Instruments, Development and description of the instruments, Method of data collection procedure and Plan for Statistical Analysis.

METHODOLOGY

This study was undertaken at the Institute of Neurology, Rajiv Gandhi Government General Hospital, Chennai, among 60 patients who were admitted during 29th of August to 29th September 2011.

3.1. RESEARCH APPROACH

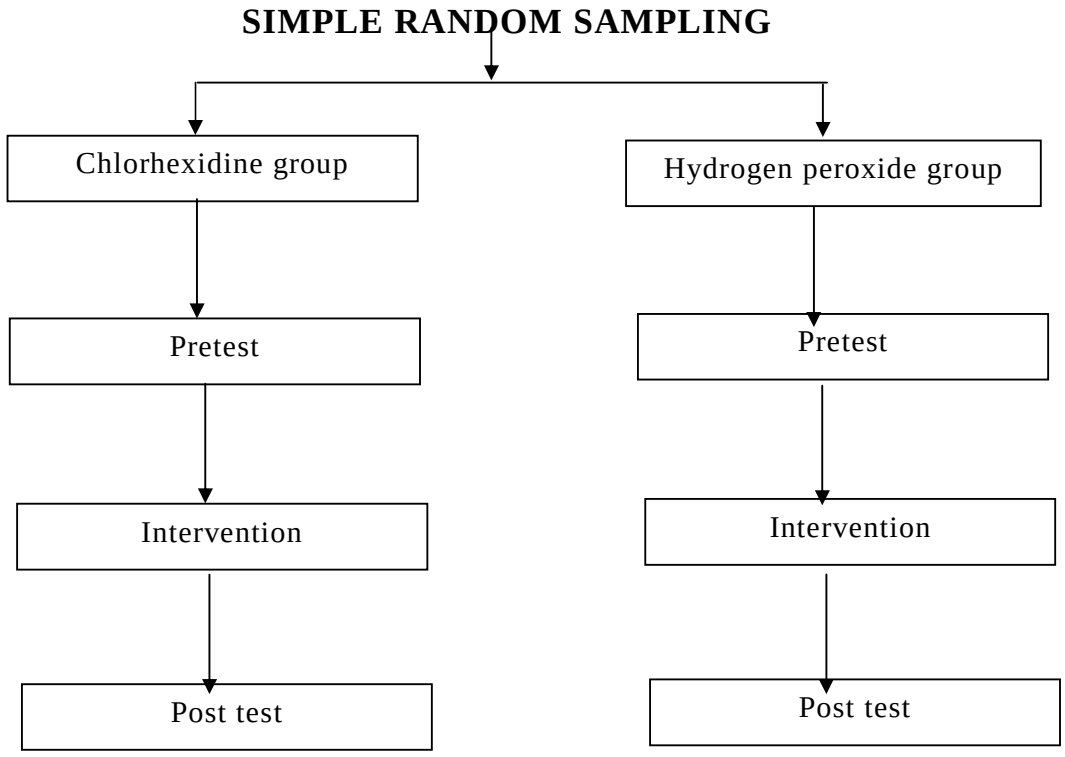
Research approach is the most significant part of any research. The appropriate choice of the research approach depends upon the purpose of the research study which has been undertaken in order to accomplish the main objectives of the study; a quantitative approach was used for this study to test the effect of chlorhexidine mouthwash and hydrogen peroxide solution prepared for bed ridden patients regarding oral care.

3.2. RESEARCH DESIGN

The research is designed as explicit blue print for research activities to be carried out. Research designs help the researcher in selection of samples, identification of variables, their manipulation and control.

Research design incorporates some of the most important methodological decisions that the researcher makes in conducting the study. A research design is a researcher's over all plan for obtaining answers to research questions or for testing the research hypothesis. Research design focuses on the basic strategy that the researcher adopts to develop information in accurate and interpretable manner. Observations are to be made and different types of statistical analysis are used to interpret the data.

The research design selected for the present study is true experimental Comparative research design- pre test post test control group design which comprises of random, control and manipulation.



GROUP-I (CHLORHEXIDINE GROUP)

Oral care with chlorhexidine mouthwash.

GROUP-II (HYDROGEN PEROXIDE GROUP)

Oral care with hydrogen peroxide solution.

3.3. RESEARCH VARIABLES

Independent variable in this study is chlorhexidine mouth wash and hydrogen peroxide dependent variable in improving the oral health.

3.4. SETTING

The study was conducted at The Institute of Neurology, Rajiv Gandhi Government General Hospital, Chennai-03. It is one of the biggest hospitals in South East Asia. This hospital has almost all specialties and super specialties. It is an educational and research institute as well as a referral hospital. The total bed strength of this hospital is 2729. It is an educational and research institute as well as a referral hospital. The Institute of Neurology Department consist Head Injury Ward, Post Operative Ward , Neuro Medical And Surgical Ward, Neuro ICU, EEG lab and periodical follow up done and also be followed with well equipped surgical procedures.

3.5. POPULATION

The population of this study comprised of 60 patients admitted at the Institute Of Neurology Department at Rajiv Gandhi Government General Hospital, Chennai-03 during the period of study.

3.6. SAMPLE

Sample consist of patients who fulfill the inclusion criteria where selected from the neruo ward at Rajiv Gandhi Government General Hospital, Chennai-03.

3.7. SAMPLING TECHNIQUE

Samples were selected using simple random sampling technique using lottery method. This sample consists of bed ridden patients who fulfilled the criteria for selection and were admitted in Institute of Neurology Department, Rajiv Gandhi Government General Hospital, Chennai-03.

3.8. SAMPLE SIZE

Sample comprised of 60 bed ridden patients.

30- Receiving oral care by using chlorhexidine mouthwash

30- Receiving oral care by using hydrogen peroxide solution.

3.9. CRITERIA FOR SAMPLE SELECTION

Inclusion criteria:

- Patients age group>20 years.
- Both male and female patients.
- Patients who are willing to participate.
- Patients who are conscious and not able to perform their activities of daily living.

Exclusion criteria

- Patients who are below 20 years.
- Patients who are unconscious.
- Patients who are able to perform their activities of daily living.
- Patients who are selected for pilot study

3.10. DEVELOPMENT AND DISCRIPTION OF TOOL

The tool was developed by the investigator after reviewing the related literature and few assessment tools.

Before the tool was administered some informal discussion were made with the patient to establish rapport. So that they would be relaxed, the questionnaire was administered to them and asked to give appropriate response for all the statements. The patients were been assured that their responses would be confidential and will used only for the research purpose.

THE TOOL CONSISTED OF TWO SECTIONS

Section-A

This section contains the demographic and clinical data of patients in the sample.

Section-B

This section contains modified tool for oral health assessment scale.

Scoring Techniques

The questionnaire consisted of 8 questions with score. The score is categorized as follows.

CRITERIA	SCORE
Normal	0
Mild	1-5
Moderate	6-10
Severe	11-16

3.11. TESTING THE TOOL:

Content validity

Validity of the tool was assessed using content validity. Content validity was determined by experts from Nursing and Medical professionals. They suggested certain modifications in the tool. After the modifications they agreed this tool for assessing the oral health among bedridden patients in neurology department.

Reliability of the tool:

After pilot study, reliability of the tool was assessed by using split half method. Clinical parameter scale reliability correlation coefficient is 0.82 and

bio-physical parameter scale reliability correlation coefficient is 0.80. These reliability coefficients are very high and it is good tool for assessing the effectiveness of Chlorhexidine mouthwash and Hydrogen Peroxide to improve the oral health of bedridden patients.

3.12. PROTECTION OF HUMAN RIGHTS:

Formal Ethical clearance was obtained from the Ethical committee before starting the study. All the samples or the relatives of the samples were explained about the study and informed consent was obtained from them. Samples were given assurance that all the data collected will be kept confidential.

3.13. PILOT STUDY

Pilot study was conducted in the Institute of Neurology Department, Rajiv Gandhi Government General Hospital, Chennai-03 in order to test the feasibility, relevance and practicability of the study. The study was conducted on 6 patients for 1 week

After obtaining the written permission from Principal, College of Nursing, Madras Medical College, Chennai -03 and the Dean, written consent was obtained from the subjects. Pre determined criteria was set by the investigator through random sampling. Pilot study was conducted for one week among six bed ridden patients in Institute of Neurology department. The objective of the study were explained to each sample and confidentiality was assured. The investigator conducted the study and administered the chlorhexidine mouth wash and hydrogen peroxide among bedridden patients in Neurology Department. Finally seventh day the post test was conducted among both groups with the same questionnaire. Statistical analysis of the pilot study revealed that there was a significant increase in the scores of the patients. The tool was found to feasible and no change was made after the pilot study. The data were analyzed using descriptive and inferential statistics.

3.14. DATA COLLECTION PROCEDURE

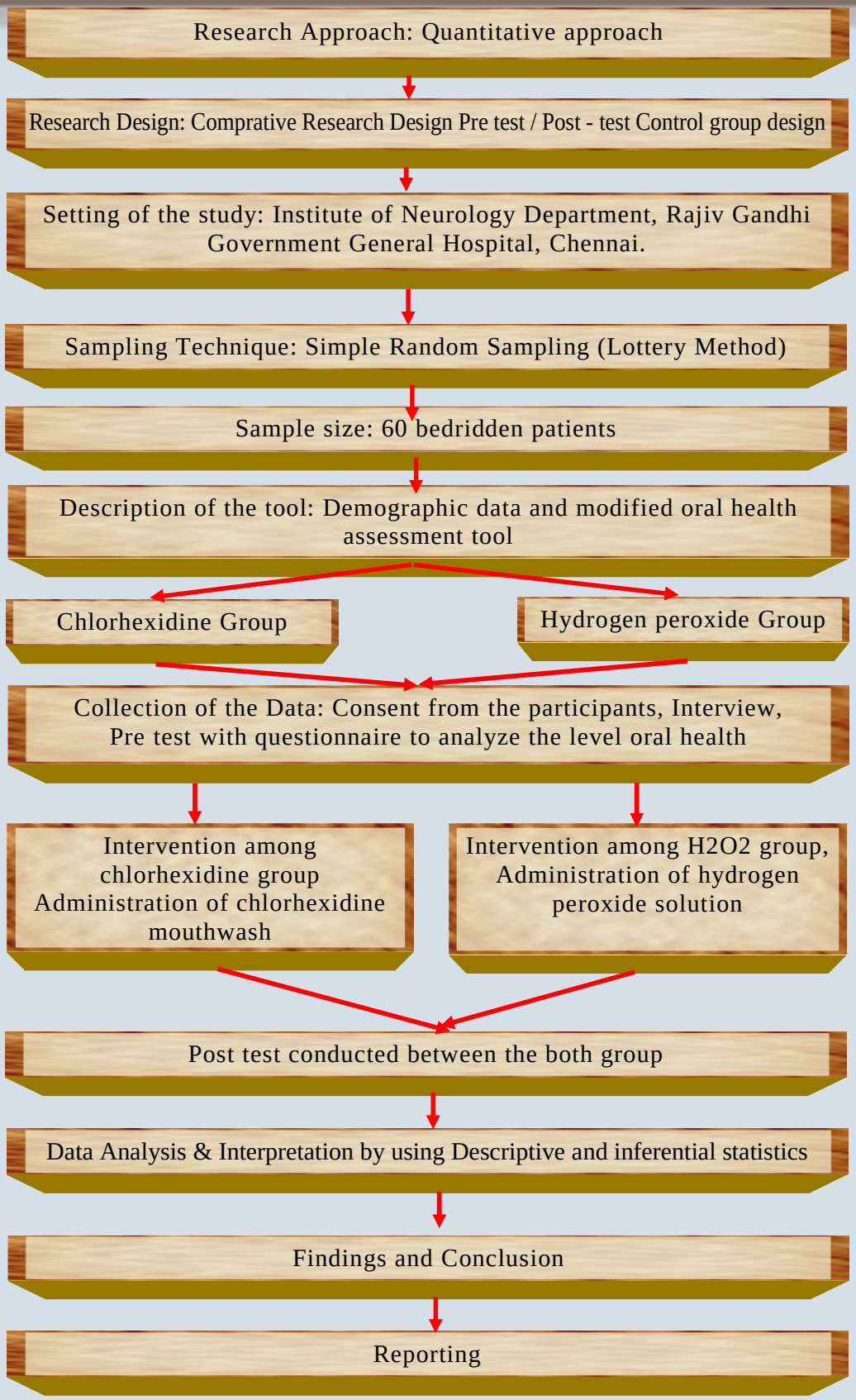
The investigator obtained prior permission from the concerned authority in Institute of Neurology Department, Rajiv Gandhi Government General Hospital, Chennai -03.Data was collected from 29-09-11 to 29-10-11. The samples were selected by using simple random sampling lottery method. The investigator introduced herself and explained the purpose of the study and obtained written consent from the patients which ensures confidentiality. Demographic and clinical data was collected by interview method and data regarding the oral health collected by using modified oral health assessment tool.

In the pre test the demographic and clinical data of patients were collected and oral health assessment was done by using modified oral health assessment tool. During the intervention along with routine care, the investigator used chlorhexidine mouth wash and hydrogen peroxide solution for oral care. Oral care was given twice a day for seven days. In post test oral health of both the groups assessed and compared by using the same tool.

3.15. DATA ANALYSIS

Descriptive and inferential statistics were planned to analyze the collected data.

SCHEMATIC REPRESENTATION OF THE RESEARCH DESIGN



CHAPTER-IV
DATA ANALYSIS AND INTERPRETATION

Data analysis is method of organizing data in such a way that the research question can be answered. Interpretation is the process of making sense of results and of examining the implication of the findings within a broader context.

This chapter deals with the analysis and interpretation of data collected from bedridden patients of Institute of Neurology Department.

The data has been organised and presented in six sections:

Section-A : Demographic variables and clinical data

Section-B : Assessment of pre test score of oral health of both the group

Section-C : Assessment of pre test and post test mean score of oral health(chlorhexidine group)

Section-D : Assessment of pre test and post test mean score of oral health assessment (hydrogen peroxide group)

Section-E : Association of pre test level of oral health score of both the group

Section-F : Association between post test level of oral health score and demographic variables (chlorhexidine group)

SECTION-A

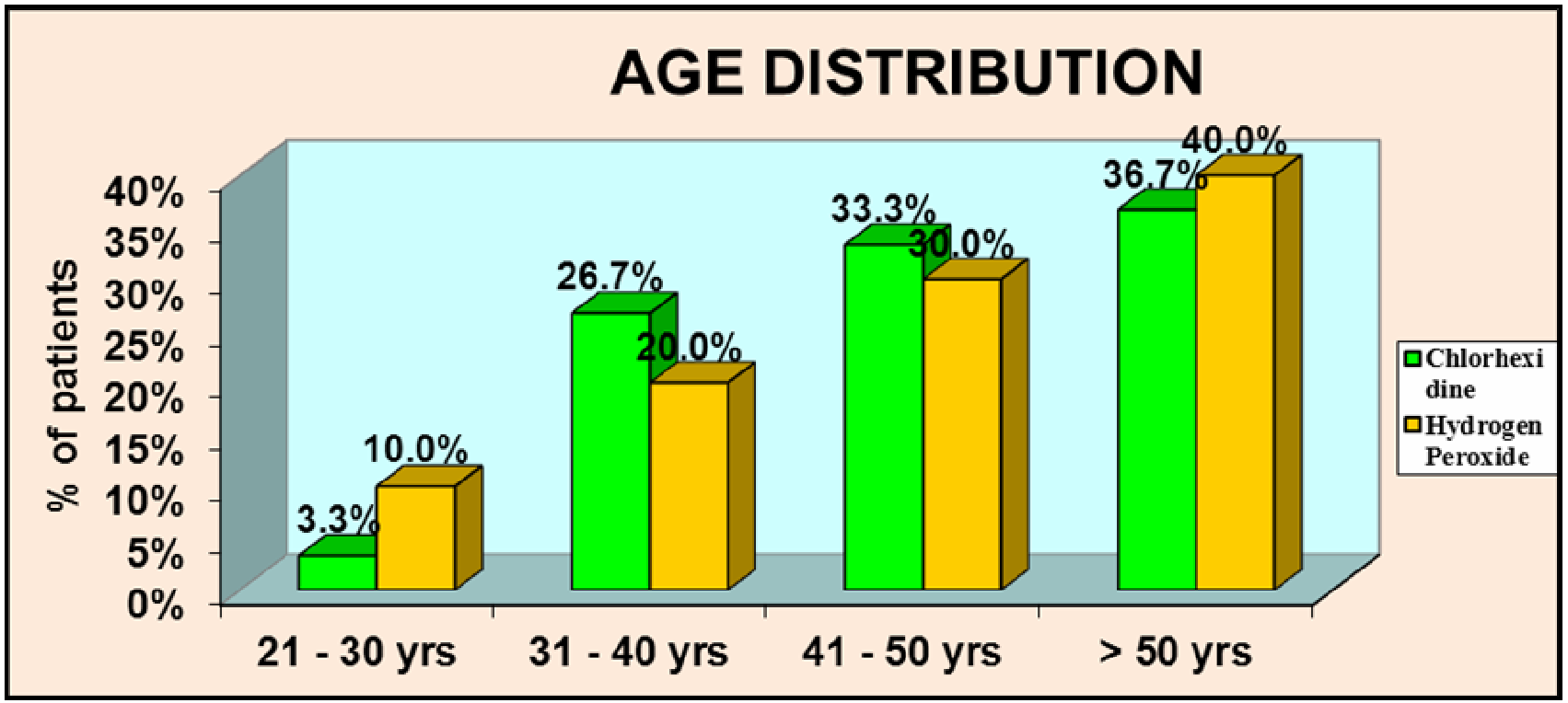
Table-1: SOCIO DEMOGRAPHIC AND CLINICAL DATA DETAILS OF THE PATIENTS

Demographic and clinical variables		***Group***			
		Chlorhexidine Group		***Hydrogen Peroxide Group***	
		N	***%***	***N***	***%***
Age	21 - 30 yrs	1	3.3%	3	10.0%
	31 - 40 yrs	8	26.7%	6	20.0%
	41 - 50 yrs	10	33.3%	9	30.0%
	> 50 yrs	11	36.7%	12	40.0%
Sex	Male	28	93.3%	25	83.3%
	Female	2	6.7%	5	16.7%
Religion	Hindu	24	80.0%	23	76.7%
	Muslim	3	10.0%	2	6.7%
	Christian	3	10.0%	5	16.7%
Occupation	Government	0	0.0%	2	6.7%
	Private	23	76.7%	19	63.3%
	Business	2	6.7%	3	10.0%
	Unemployed	5	16.7%	6	20.0%
Education	Uneducated	7	23.3%	4	13.3%
	Primary education	12	40.0%	10	33.3%
	Higher secondary	10	33.3%	11	36.7%
	Graduate	1	3.3%	5	16.7%
Diet	Vegetarian	2	6.7%	6	20.0%
	Non vegetarian	28	93.3%	24	80.0%

Demographic and clinical variables		*Group*			
		Chlorhexidine Group		*Hydrogen Peroxide Group*	
		N	*%*	*N*	*%*
Marital Status	Married	27	90.0%	25	83.3%
	Unmarried	3	10.0%	5	16.7%
Cause of Illness	Accident	12	40.0%	14	46.7%
	Infection	6	20.0%	7	23.3%
	Systemic illness	8	26.7%	6	20.0%
	Idiopathic	4	13.3%	3	10.0%
Length of hospital Stay	5 -10 days	3	10.0%	5	16.7%
	11 -15 days	22	73.3%	15	50.0%
	>15 days	5	16.7%	10	33.3%
Duration of Illness	> 5 days	30	100.0%	30	100.0%

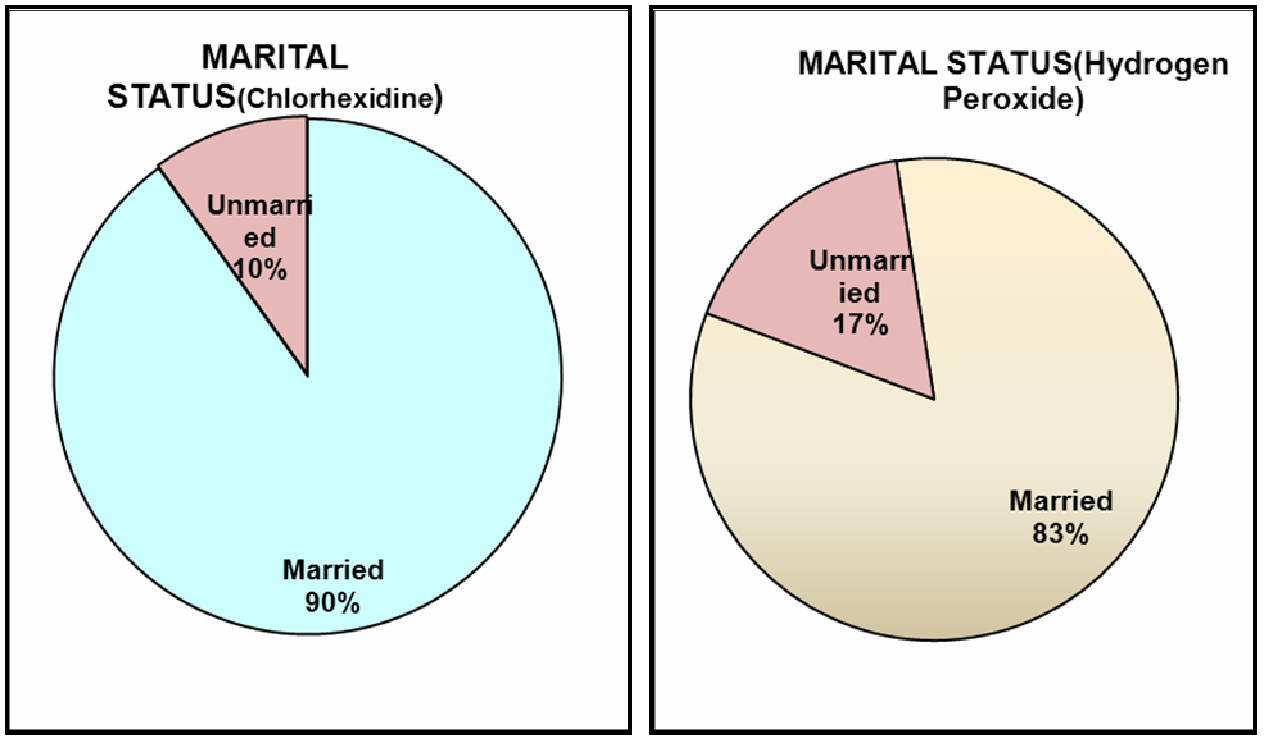
Table No1 shows the , Majority of the samples were belongs to the age group of > 50 years in chlorhexidine group (36.7%) and in hydrogen peroxide group (40.0%). Majority of the samples were male in Chlorhexidine group(93.3%) and hydrogen peroxide group (83.3%). Majority (40.0%) of samples have completed primary education in chlorhexidine group and in hydrogen peroxide group(36.7%) samples were completed higher secondary education. Majority (80.0%) of the samples belongs to Hindu religion in chlorhexidine group and (76.6%) of them belong to hydrogen peroxide group. Majority (73.3%) of the samples stayed in hospital between 11-15 days in chlorhexidine group and (50.0%) in hydrogen peroxide group. Duration of illness was more than 5 days (100%) in both the groups.

Fig-3: Percentage distribution of age



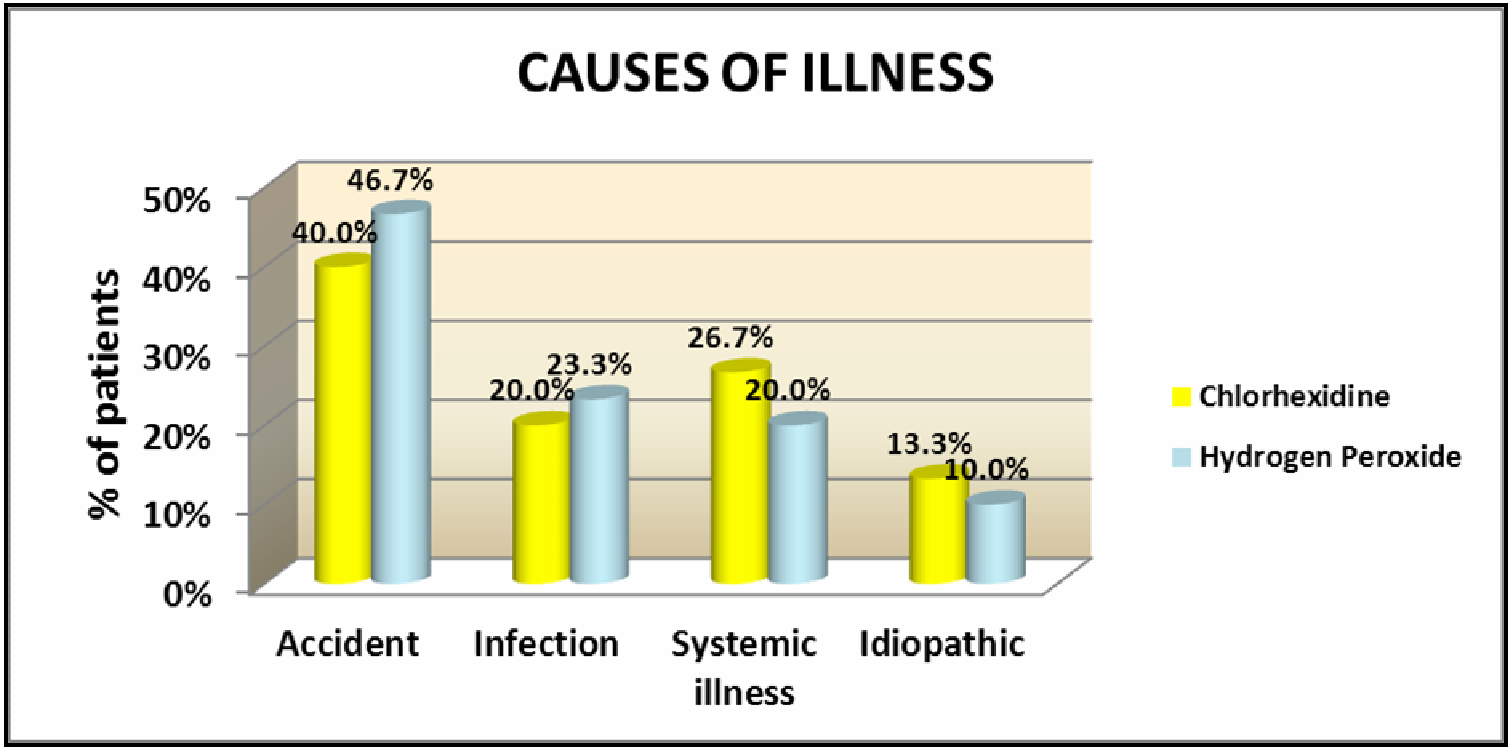
Above figure shows that majority of samples in the both groups were belong to the age group of >50 years

Fig -4: Percentage distribution of marital status



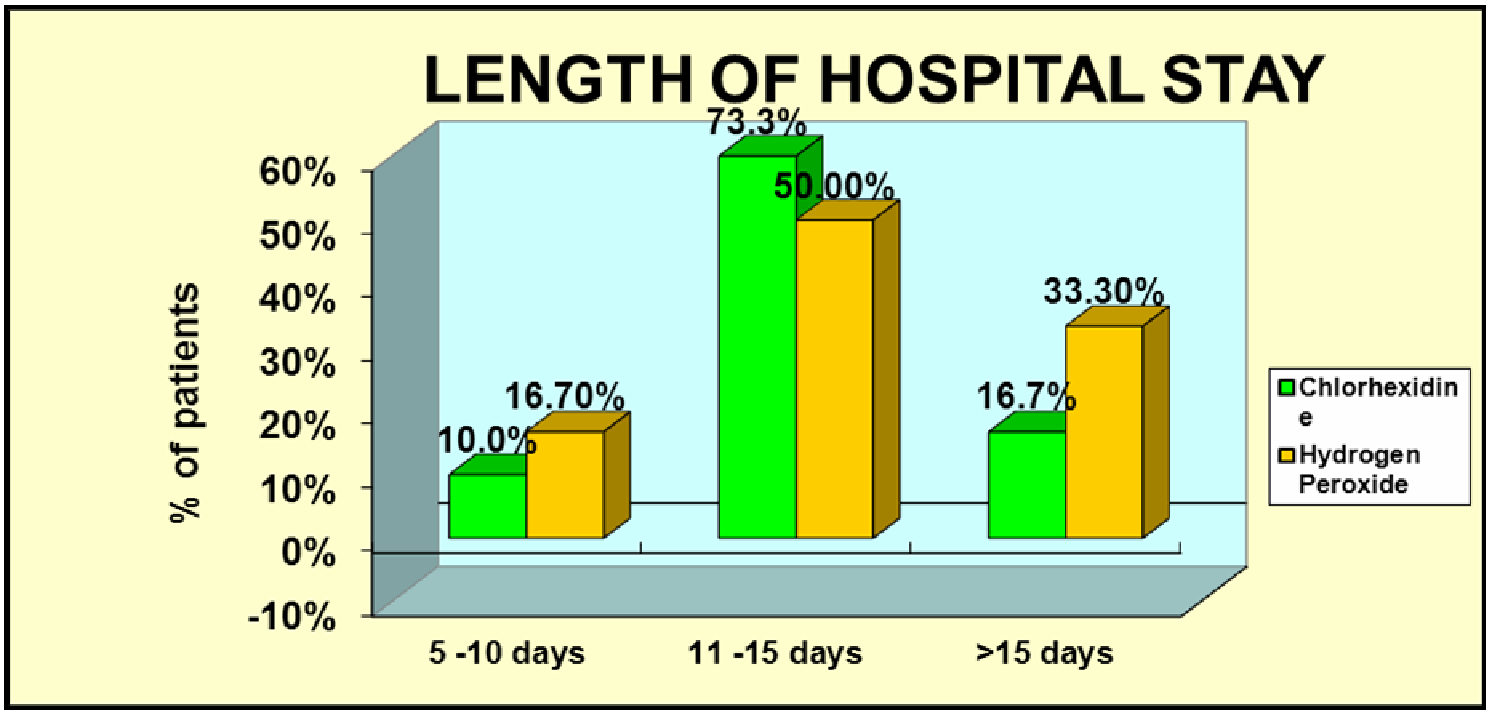
Above figure shows most of them were got married in the both chlorhexidine and hydrogen peroxide group.

Fig- 5: Percentage distribution of causes of illness.



Above figure shows that the majority of cause of illness was accident in the both the groups.

Fig-6: Percentage distribution of length of hospital stay



Above figure shows most of the samples are stayed in the hospital for more than 11-15 days in the both the groups.

SECTION-B

Table-2: COMPARISON OF PRE TEST SCORE OF ORAL HEALTH OF BOTH THE GROUP

Oral Assessment Scale		***Group***			
		Chlorhexidine Group		***Hydrogen Peroxide Group***	
		n	***%***	***N***	***%***
LIPS	Smooth, pink, moist	0	0.0%	0	0.0%
	Dry, chapped or red at corners	10	33.3%	11	36.7%
	Swelling or lump	20	66.7%	19	63.3%
TONGUE	Normal	0	0.0%	0	0.0%
	Patchy, fissured	11	36.7%	13	43.3%
	Patch that is red	19	63.3%	17	56.7%
GUMS AND TISSUES	Pink, moist	0	0.0%	0	0.0%
	Dry, shiny	4	13.3%	3	10.0%
	Swollen, bleeding	26	86.7%	27	90.0%
SALIVA	Moist tissues,	0	0.0%	0	0.0%
	Dry, sticky tissues	9	30.0%	10	33.3%
	Tissues parched	21	70.0%	20	66.7%
NATURAL TEETH	No decayed	0	0.0%	0	0.0%
	1-3 decayed	22	73.3%	15	51.7%
	4 + decayed	8	26.7%	14	48.3%

Oral Assessment Scale		*Group*			
		Chlorhexidine Group		*Hydrogen Peroxide Group*	
		n	***%***	***N***	***%***
DENTURES	No broken areas	30	100.0%	30	100.0%
	1 broken area	0	0.0%	0	0.0%
	>1 broken area	0	0.0%	0	0.0%
ORAL CLEANLINESS	Clean and no food particles	0	0.0%	0	0.0%
	Food particles	2	6.7%	2	6.7%
	Food particles tatar	28	93.3%	28	93.3%
DENTAL PAIN	No behavioural	0	0.0%	0	0.0%
	Behavioural signs	13	43.3%	15	50.0%
	Physical pain	17	56.7%	15	50.0%

Table 1 shows the percentage of oral health assessment score before the intervention in both chlorhexidine and hydrogen peroxide groups.

Table-3: PRE TEST LEVEL OF ORAL HEALTH ASSESSMENT SCORE FOR CHLORHEXIDINE AND HYDROGEN PEROXIDE GROUP

Level of score	Chlorhexidine group		Hydrogen peroxide group	
	n	%	n	%
Normal	0	0.0%	0	0.0%
Mild	0	0.0%	0	0.0%
Moderate	3	10.0%	5	16.7%
Severe	27	90.0%	25	83.3%
Total	30	100.0%	30	100.0%

Table 3: Shows the comparison of level of oral health assessment score before the administration of chlorhexidine mouth wash and hydrogen peroxide. Before administration of chlorhexidine mouth wash, 3 (10.0%) of patients were having moderate oral health,27(90%) of them were having severe level and none of them had normal and mild level. The comparison of level of Oral health assessment score before the administration of hydrogen peroxide. In hydrogen peroxide group, before administration of hydrogen peroxide, 5(16.7%) of patients are having moderate oral health,25 (83.3%) of them were having severe level and none of them had normal and mild level.

SECTION-C

Table-4: COMPARISON OF PRE TEST AND POST TEST MEAN SCORE OF ORAL HEALTH ASSESSMENT (Chlorehexidine group)

	No. of patients	**Pretest Mean±SD**	**Posttest Mean±SD**	**Student's paired t-test**
Oral health assessment score	30	11.67±1.02	2.40±1.47	t=29.49 P=0.001*** DF =29

* Significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

Table 4 Shows the comparison of oral health assessment score before and after the administration of chlorhexidine mouth wash. On an average, chlorhexidine mouth wash patients saw a reduction in their oral health assessment score from 11.67 to 2.40 after the administration of chlorhexidine mouth wash. Due to chlorhexidine mouth wash they were able to reduce 9.27 score from base line score. This reduction is statistically significant. Statistical significance was calculated by using student's paired 't'test.

Table-5: COMPARISON OF PRE TEST AND POST TEST LEVEL OF ORAL HEALTH ASSESSMENT SCORE (CHLOREHEXIDINE GROUP)

Level of score	**Pretest**		**Posttest**	
	n	**%**	**N**	**%**
Normal	0	0.0%	5	16.7%
Mild	0	0.0%	25	83.3%
Moderate	3	10.0%	0	0.0%
Severe	27	90.0%	0	0.0%
Total	30	100.0%	30	100.0%

Table 5 shows the comparison of level of oral health assessment score before and after the administration of chlorhexidine mouth wash .Before administration of chlorhexidine mouth wash, 3(10.0%) of patients were having moderate oral health, 27(90%) of them were having severe level and none of them having normal & mild level. After administration of chlorhexidine mouth wash, 5(16.7%) of them are normal, 25(83.3%) of them having mild level and none of them were having moderate and severe level.

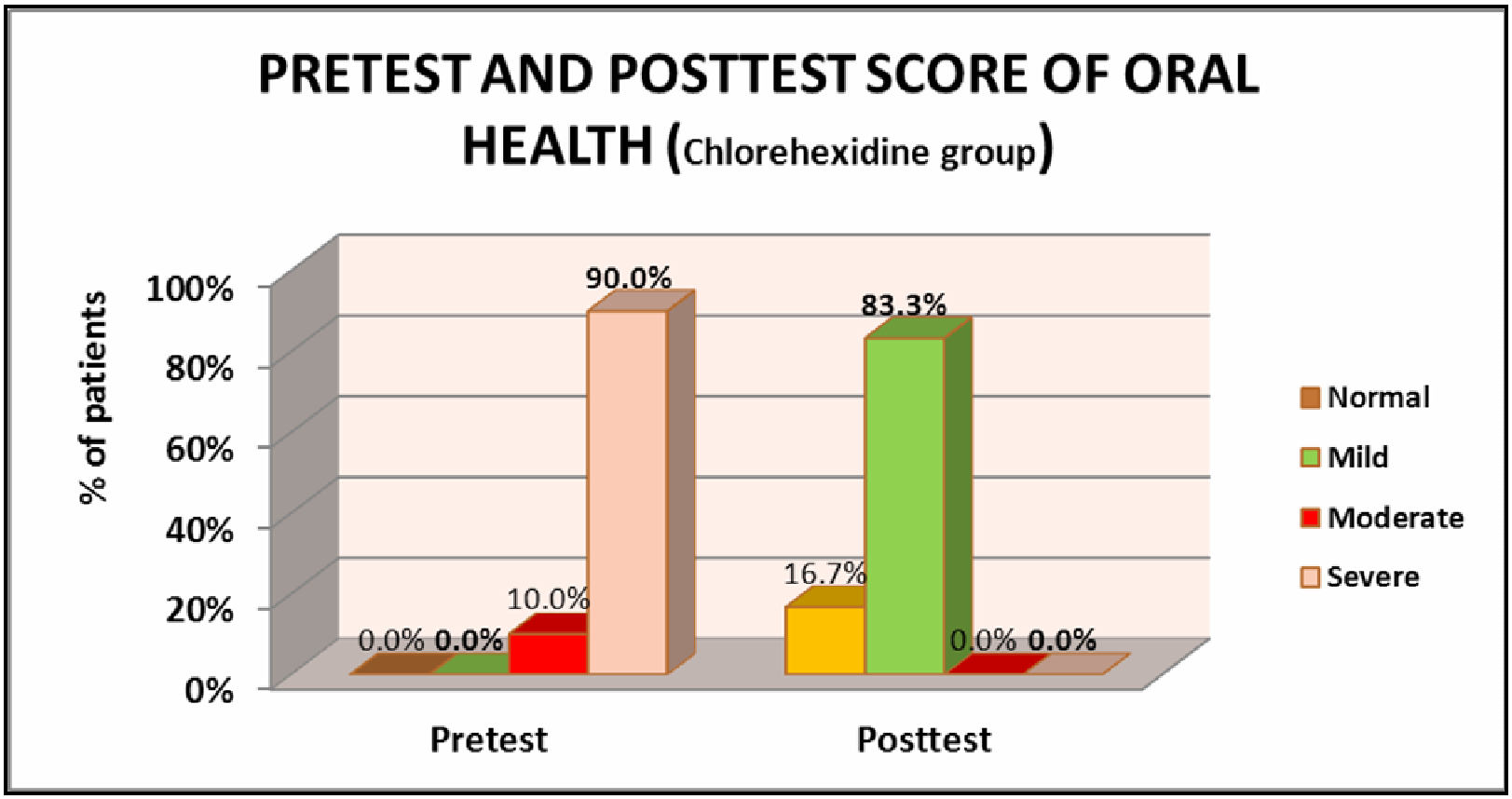
Table-6: COMPARISON OF PRE TEST AND POST TEST SCORE(Chlorhexidine Group)

Oral Health Assessment Tool	Pretest		Posttest		Student's paired t-test
	Mean	SD	Mean	SD	
Lips	1.67	.48	0.10	.31	t=15.09 P=0.001 *** DF= 29 , Significant
Tongue	1.67	.48	0.07	.25	t=15.55 P=0.001 *** DF= 29 , Significant
Gums and Tissues	1.87	.35	0.50	.51	t=13.46 P=0.001 *** DF= 29 , Significant
Saliva	1.70	.47	0.10	.31	t=17.58 P=0.001 *** DF= 29 , Significant
Natural teeth	1.27	.45	0.93	.52	t=2.03 P=0.005** DF= 29 , not Significant
Dentures	0.00	.00	0.00	.00	t=0.00 P=1.00 DF= 29 , Significant
Oral cleanliness	1.93	.25	0.60	.50	t=13.35 P=0.001 *** DF= 29 , Significant
Dental pain	1.57	.50	0.10	.31	t=15.85 P=0.001 *** DF= 29 , Significant

* significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

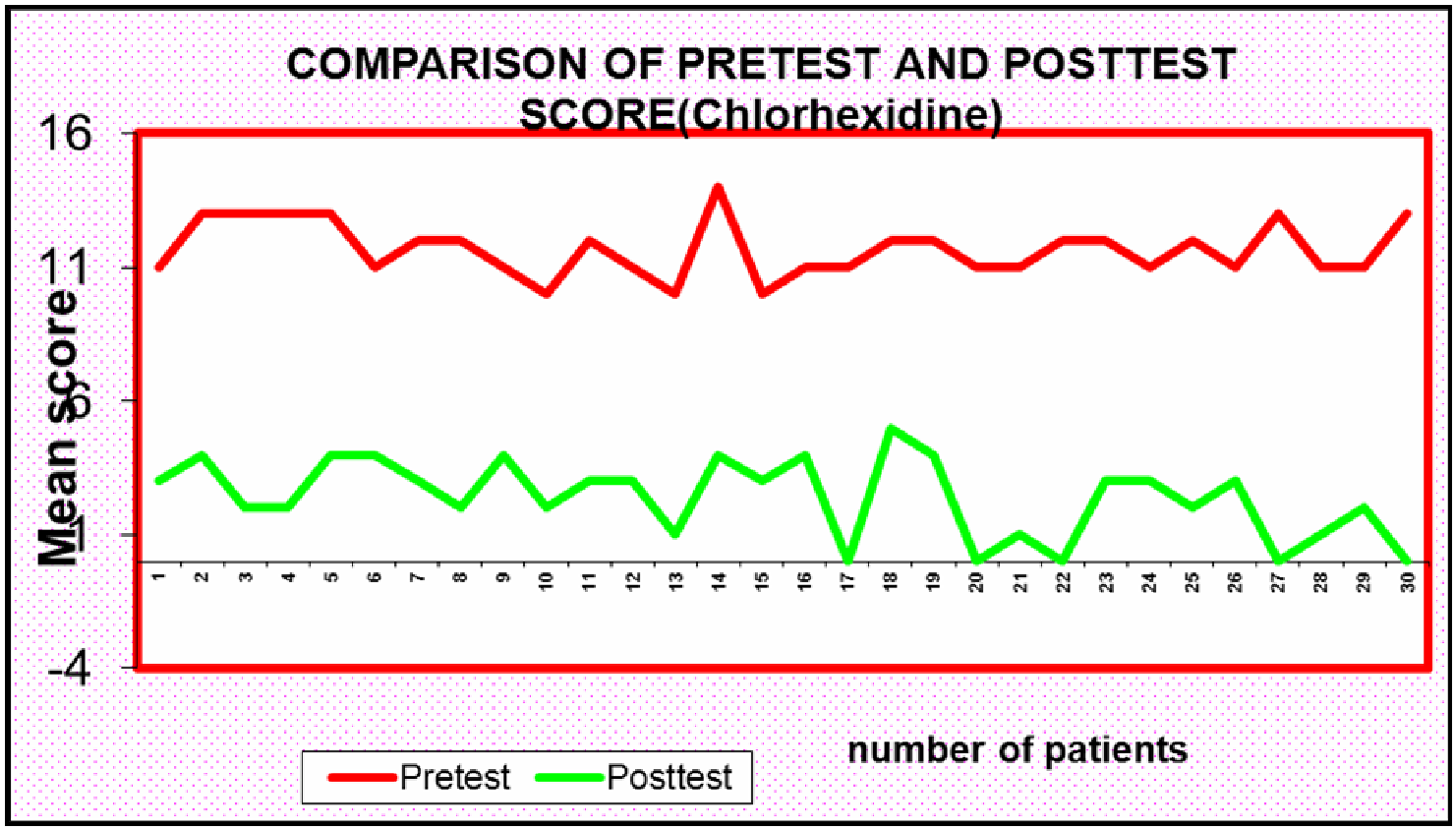
Table 6 shows the comparison of Chlorhexidine Group pre test and post test oral health assessment score. In all aspects except dentures there is statistically significance difference between pre test and post test .

Fig - 7: Pre test and post test level of oral health score in chlorhexidine group.



Above shows the pretest and post test level of oral health in chlorhexidine group.

Fig-8:Comparison of pre test and post test score (Chlorhexidine)



Above figure shows the comparison of pre test and post test oral health assessment score for chlorhexidine group.

SECTION-D

Table-7: COMPARISON OF PRE TEST AND POST TEST MEAN SCORE OF ORAL HEALTH ASSESSMENT (hydrogen peroxide group)

	No. of patients	**Pretest Mean±SD**	**Posttest Mean±SD**	**Student's paired t-test**
Oral health assessment score	30	11.60±1.10	6.20±1.03	t=21.83 P=0.001*** DF =29

* significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

Table 7 shows the comparison of oral health assessment score before and after the administration of hydrogen peroxide. On an average, hydrogen peroxide patients are reduced their Oral health assessment score from 11.60 to 6.20 after the administration of hydrogen peroxide. Due to hydrogen peroxide they are able to reduce 5.4 score from base line score. This reduction is statistically significant. Statistical significance was calculated by using student's paired 't'test

Table-8: COMPARISON OF PRE TEST AND POST TEST LEVEL OF ORAL HEALTH ASSESSMENT SCORE (hydrogen peroxide)

Level of score	Pretest		Posttest	
	n	**%**	**N**	**%**
Normal	0	0.0%	0	0.0%
Mild	0	0.0%	6	20.0%
Moderate	5	16.7%	24	80.0%
Severe	25	83.3%	0	0.0%
Total	**30**	**100.0%**	**30**	**100.0%**

Table 8 shows the comparison of level of oral health assessment score before and after the administration of hydrogen peroxide. Before administration of hydrogen peroxide, 5(16.7%) of patients were having moderate oral health, 25(83.3%) of them were having severe level and none of them were having normal & mild level. After administration of hydrogen peroxide, 6(20.0%) of them are mild level, 24(80.0%) of them having moderate level and none of them having normal and severe level.

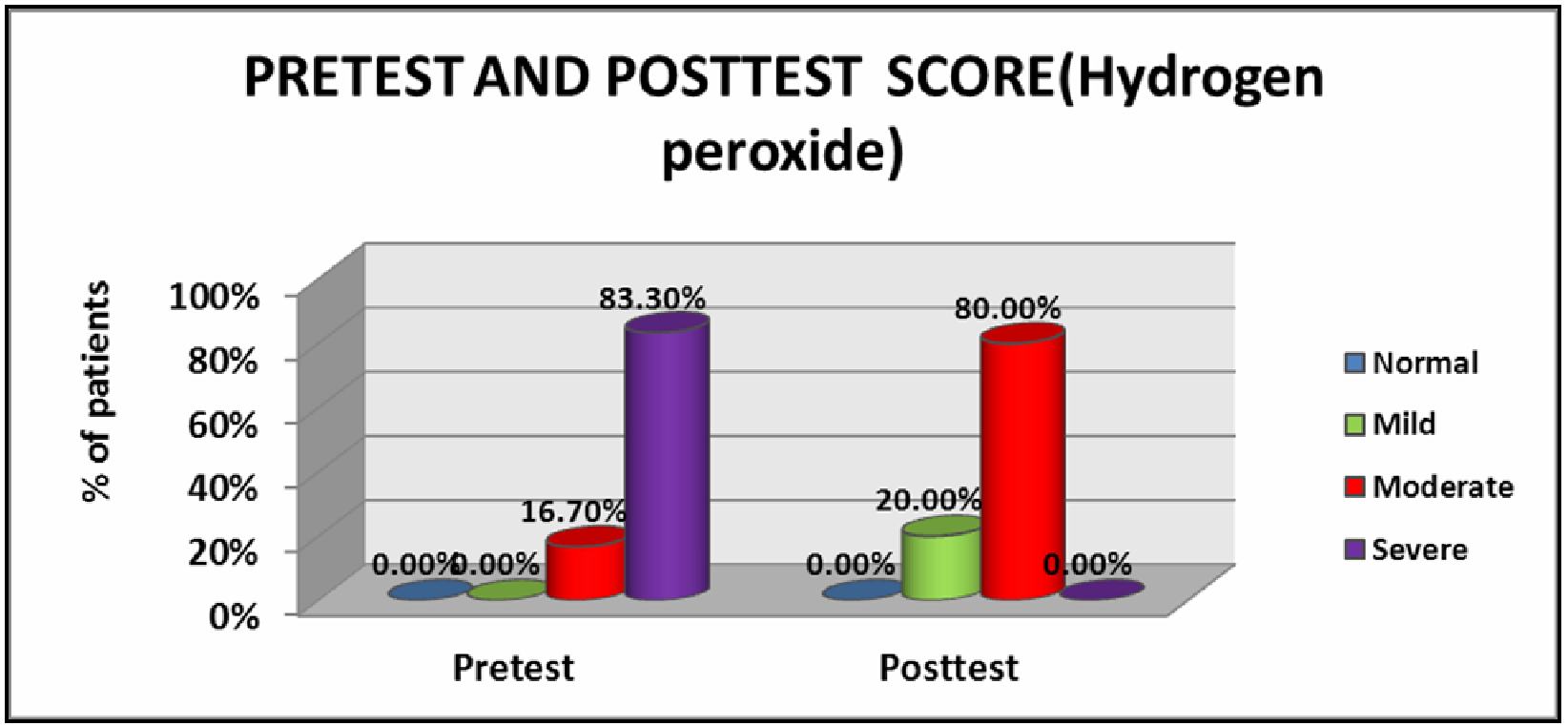
Table-9: COMPARISON OF PRE TEST AND POST TEST SCORE (Hydrogen Peroxide Group)

	Pretest		Posttest		Student's paired t-test
	Mean	**SD**	**Mean**	**SD**	
Lips	1.63	.49	0.53	.51	t=10.74 P=0.001 *** DF= 29 , Significant
Tongue	1.57	.50	0.60	.50	t=16.55 P=0.001 *** DF= 29 , Significant
Gums and Tissues	1.90	.31	1.33	.61	t=5.46 P=0.001 *** DF= 29 , Significant
Saliva	1.67	.48	0.57	.50	t=12.53 P=0.001 *** DF= 29 , Significant
Natural teeth	1.40	.50	1.40	.50	t=0.00 P=1.00 DF= 29 , not significant
Dentures	0.00	.00	0.00	.00	t=0.00 P=1.00 DF= 29 , not significant
Oral cleanliness	1.93	.25	1.27	.52	t=12.04 P=0.001 *** DF= 29 , Significant
Dental pain	1.50	.51	0.50	.51	t=21.83 P=0.001 *** DF= 29 , Significant

* Significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

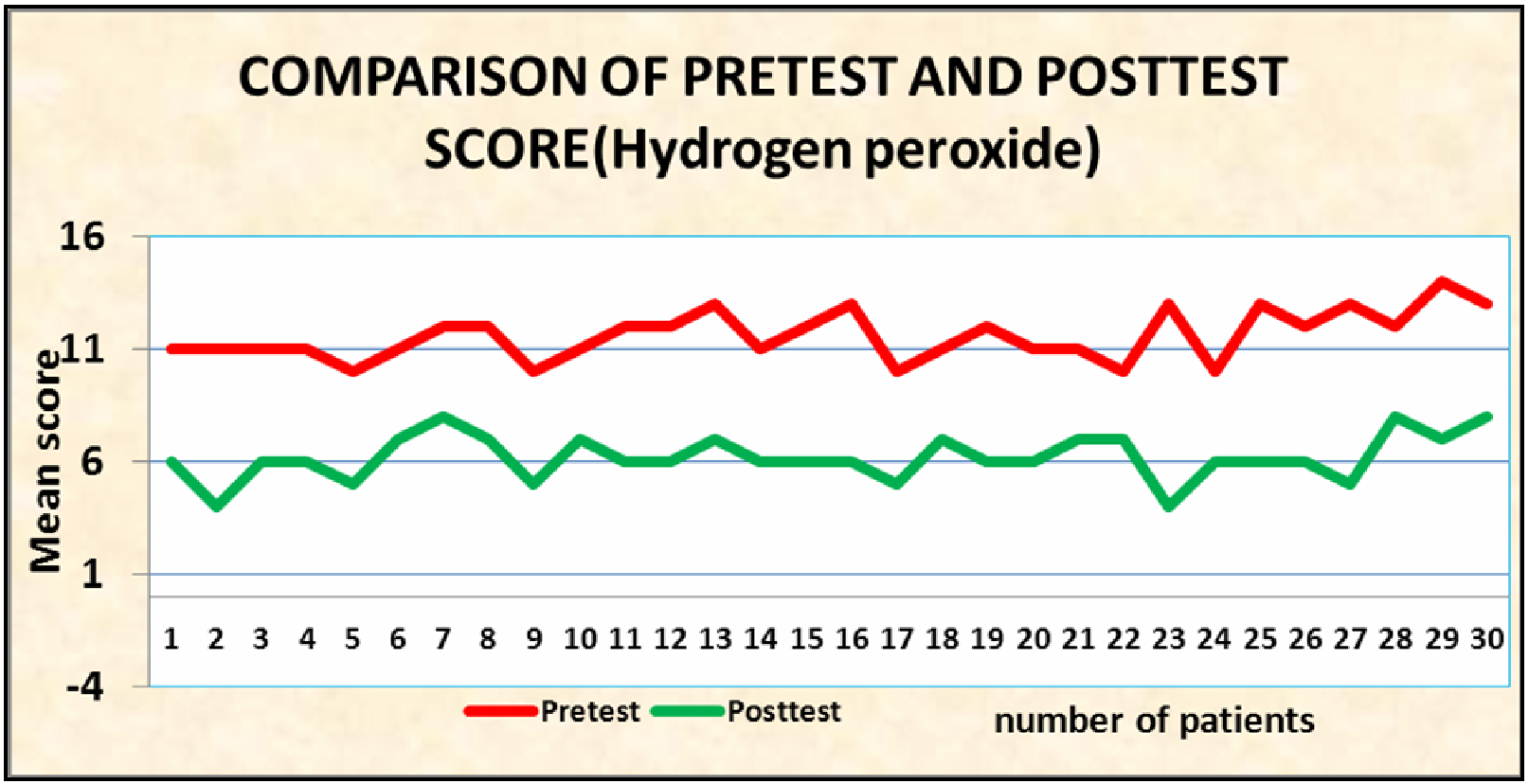
Table no 9 shows the comparison of Hydrogen Peroxide Group pre and post test oral health assessment score. In all aspects except dentures and natural teeth, there is statistically significant difference between pretest and posttest.

Fig-9: Percentage distribution of pre test and post test score for hydrogen peroxide group



Above figure shows the pre test and test Oral Health Assessment score Hydrogen peroxide Group.

Fig-10: Comparison of pre test andpost test score (Hydrogen Peroxide)



Above figure shows the comparison of pretest and post test oral health assessment score for hydrogen peroxide group.

SECTION-E

Table-10: ASSOCIATION OF PRE TEST LEVEL OF ORAL HEALTH SCORE OF BOTH THE GROUP

Oral Assessment Scale		***Group***				***Yeates Chi square test***
		Chlorhexidine Group		***Hydrogen Peroxide Group***		
		n	***%***	***N***	***%***	
LIPS	Smooth,pink,moist	0	0.0%	0	0.0%	$\chi 2=0.07$ P=0.79 DF=2
	Dry, chapped or red at corners	10	33.3%	11	36.7%	
	Swelling or lump	20	66.7%	19	63.3%	
TONQUE	Normal	0	0.0%	0	0.0%	$\chi 2=0.27$ P=0.59 DF=2
	Patchy, fissured	11	36.7%	13	43.3%	
	Patch that is red	19	63.3%	17	56.7%	
GUMS AND TISSUES	Pink, moist	0	0.0%	0	0.0%	$\chi 2=0.16$ P=0.68 DF=2
	Dry, shiny	4	13.3%	3	10.0%	
	Swollen, bleeding	26	86.7%	27	90.0%	
SALIVA	Moist tissues,	0	0.0%	0	0.0%	$\chi 2=0.08$ P=0.78 DF=2
	Dry, sticky tissues	9	30.0%	10	33.3%	
	Tissues parched	21	70.0%	20	66.7%	
NATURAL TEETH	No decayed	0	0.0%	0	0.0%	$\chi 2=2.95$ P=0.09 DF=2
	1-3 decayed	22	73.3%	15	51.7%	
	4 + decayed	8	26.7%	14	48.3%	
DENTURES	No broken areas	30	100.0%	30	100.0%	$\chi 2=0.00$ P=1.00 DF=2
	1 broken area	0	0.0%	0	0.0%	
	>1 broken area	0	0.0%	0	0.0%	

Oral Assessment Scale		*Group*				*Yeates Chi square test*
		Chlorhexidine Group		*Hydrogen Peroxide Group*		
		n	***%***	***N***	***%***	
ORAL CLEANLINESS	Clean and no food particles	0	0.0%	0	0.0%	$\chi 2=0.00$ P=1.00 DF=2
	Food particles	2	6.7%	2	6.7%	
	Food particles tatar	28	93.3%	28	93.3%	
DENTAL PAIN	No behavioural	0	0.0%	0	0.0%	$\chi 2=0.26$ P=0.60 DF=2
	Behavioural signs	13	43.3%	15	20.0%	
	Physical pain	17	56.7%	15	50.0%	

* Significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

Table 10 shows the pre test level of oral health, there is absence statistical significant difference between Chlorhexidine Group and Hydrogen Peroxide Group. Significance difference between groups was calculated using Pearson chi square test.

Table-11: ASSOCIATION OF POSTTEST LEVEL OF ORAL HEALTH SCORE FOR BOTH THE GROUP

Oral Assessment Scale		***Group***				***Yeates Chi square test***
		Chlorhexidine Group		***Hydrogen Peroxide Group***		
		n	***%***	***n***	***%***	
LIPS	Smooth, pink, moist	27	90.0%	14	46.7%	$\chi 2$=13.01 P=0.001*** DF=1
	Dry, chapped or red at corners	3	10.0%	16	53.3%	
	Swelling or lump	0	0.0%	0	0.0%	
TONQUE	Normal	28	93.3%	12	40.0%	$\chi 2$=19.20 P=0.001*** DF=1
	Patchy, fissured	2	6.7%	18	60.0%	
	Patch that is red	0	0.0%	0	0.0%	
GUMS AND TISSUES	Pink,moist	15	50.0%	2	6.7%	$\chi 2$=21.97 P=0.001*** DF=2
	Dry, shiny	15	50.0%	16	53.3%	
	Swollen, bleeding	0	0.0%	12	40.0%	
SALIVA	Moist tissues,	27	0.0%	13	0.0%	$\chi 2$=14.70 P=0.001*** DF=1
	Dry, sticky tissues	3	30.0%	17	33.3%	
	Tissues parched	0	0.0%	0	0.0%	

Oral Assessment Scale		*Group*				*Yeates Chi square test*
		Chlorhexidine Group		*Hydrogen Peroxide Group*		
		n	***%***	***n***	***%***	
NATURAL TEETH	No decayed	5	16.7%	0	0.0%	$\chi 2$=10.80 P=0.01** DF=2
	1-3 decayed	22	73.3%	18	60.0%	
	4+ decayed	3	10.0%	12	40.0%	
DENTURES	No broken areas	30	100.0%	30	100.0%	$\chi 2$=0.00 P=1.00 DF=1
	1 broken area	0	0.0%	0	0.0%	
	>1 broken area	0	0.0%	0	0.0%	
ORAL CLEANLINESS	Clean and no food particles	12	40.0%	1	3.3%	$\chi 2$=18.43P=0.001*** DF=1
	Food particles	18	60.0%	20	66.7%	
	Food particles tatar	0	0.0%	9	30.0%	
DENTAL PAIN	No behavioural	27	90.0%	15	50.0%	$\chi 2$=11.42 P=0.001*** DF=1
	behavioural signs	3	10.0%	15	50.0%	
	Physical pain	0	0.0%	0	0.0%	

* significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

Table 11 shows the post test level of oral health assessment score; there is a statistically significant difference between Chlorhexidine Group and Hydrogen Peroxide Group. In all aspects except dentures there is statistically significance difference between groups. It was calculated using Pearson chi square test.

Table-12: COMPARISON OF ORAL HEALTH ASSESSMENT SCORE IN BOTH THE GROUP

	Chlorhexidine Group	**Hydrogen Peroxide Group**	**Student's independent t-test**
Pretest	11.67 ± 1.03	11.60 ± 1.10	t=0.24 P=0.81 DF= 58 not significant
Posttest	2.40 ± 1.48	6.20 ± 1.03	t=11.56 P=0.001*** DF= 58 significant
Student's paired t-test	t=29.49 P=0.001*** DF= 29 significant	t=21.83 P=0.001*** DF= 29 significant	

* significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

Table 12, shows the pretest Chlorhexidine Group patients are having 11.67 score and Hydrogen Peroxide Group patients are having 11.60 score. The difference is 0.07 score. It is a small difference. This difference is statistically not significant. Statistical significance was calculated by using student's independent 't'test.

In post test, Chlorhexidine Group patients were having 2.40 score and Hydrogen Peroxide group of patients were having 6.20 score. The difference is 3.80 score, difference is large. This difference is statistically significant. Statistical significance was calculated by using Student's independent 't'test.

In Chlorhexidine Group, patients saw reduction in their score from 11.67 to 2.40. Due to Chlorhexidine they were able to reduce 9.27 score from baseline score. This reduction is statistically significant. Statistical significance was calculated by using Student's paired 't'test.

Hydrogen Peroxide, patients also saw reduction in their score from 11.60 to 6.20. Due to hydrogen peroxide solution they were able to reduce 5.4 score from base line. This reduction is statistically significant. Statistical significance was calculated by using Student's paired 't'test.

TABLE-13: EFFECTIVENESS OF CHLORHEXIDINE GROUP V/s HYDROGEN PEROXIDE ON IMPROVEMENT OF ORAL HEALTH.

Group	Level of Intervention	Max score	Mean score	Mean Difference in oral health score with 95% Confidence interval	Percentage Difference in oral health score with 95% Confidence interval
Chlorhexidine Group	Pretest	16	11.67	9.27(8.61 – 9.92)	57.9%(53.8% – 62.0%)
	Posttest	16	2.40		
Hydrogen Peroxide Group	Pretest	16	11.60	5.40(4.84 – 5.95)	33.8%(30.3% – 37.2%)
	Posttest	16	6.20		

Table no 13 shows on an average, in Chlorhexidine Group, patients saw reduced score of 57.9%, whereas in Hydrogen Peroxide patients are saw reduced score of 33.8% in pain. Difference is 24.1%. Chlorhexidine patients were benefited than Hydrogen Peroxide patients. Differences between pretest and posttest score was calculated using and mean difference with 95% CI and proportion with 95% CI

SECTION-F

Table-14: ASSOCIATION BETWEEN POST TEST LEVEL OF ORAL HEALTH SCORE AND DEMOGRAPHIC VARIABLES (Chlorhexidine Group)

Demographic variables		Level of Oral Health				Total	Pearson chi square/ Yates corrected chi square test
		Normal		Mild			
		n	%	n	%		
Age	21 - 40 yrs	4	44.4%	5	55.6%	9	$\chi 2=7.14$ P=0.01** DF=1
	> 40 yrs	1	4.8%	20	95.2%	21	
Sex	Male	4	14.3%	24	85.7%	28	$\chi 2=1.71$ P=0.19 DF=1
	Female	1	50.0%	1	50.0%	2	
Religion	Hindu	4	16.7%	20	83.3%	24	$\chi 2=0.00$ P=1.00 DF=1
	Muslim/Christian	1	16.7%	5	83.3%	6	
Occupation	Employed	3	12.0%	22	88.0%	25	$\chi 2=2.35$ P=0.13 DF=1
	Unemployed	2	40.0%	3	60.0%	5	
Education	Uneducated /Primary	2	10.5%	17	89.5%	19	$\chi 2=1.41$ P=0.23 DF=1
	Higher secondary/Graduate	3	27.3%	8	72.7%	11	
Diet	Vegetarian	1	50.0%	1	50.0%	2	$\chi 2=1.71$ P=0.19 DF=1
	Non vegetarian	4	14.3%	24	85.7%	28	
Marital Status	Married	3	11.1%	24	88.9%	27	$\chi 2=6.01$ P=0.01** DF=1
	Unmarried	2	66.7%	1	33.3%	3	

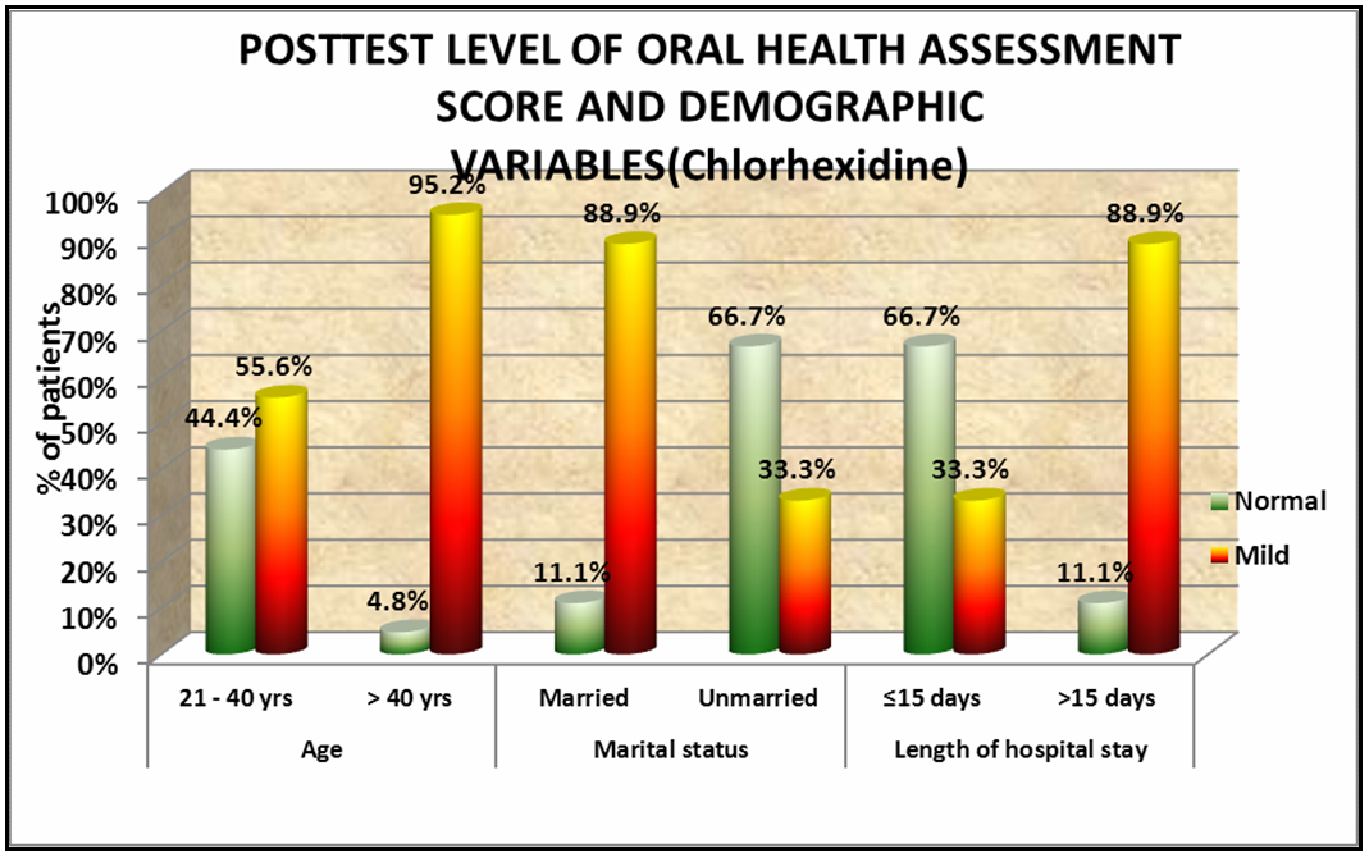
Demographic variables		Level of Oral Health				Total	Pearson chi square/ Yates corrected chi square test
		Normal		Mild			
		n	%	n	%		
Cause of Illness	Accident	3	25.0%	9	75.0%	12	χ^2=1.01 P=0.32 DF=1
	Infection/illness/ Idiopathic	2	11.1%	16	88.9%	18	
Length of hospital Stay	≤15 days	2	66.7%	1	33.3%	3	χ^2=6.00 P=0.01** DF=1
	>15 days	3	11.1%	24	88.9%	27	
Duration of Illness	≤ 5days	0	0.0%	0	0.0%	0	χ^2=0.0 P=1.00 DF=1
	> 5 days	5	16.7%	25	83.3%	30	

* significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

Table no 14 shows the association between demographic variables and their level of oral hygiene in Chlorhexidine group.

Young age, unmarried and less duration of stay in hospital patients were observed to be having better oral health than others. Statistical significance was analyzed using Pearson/ Yates corrected chi-square test

Fig-11: Association between Chlohexidine mouth wash with demographic variables



Above figure shows the association of chlorhexidine mouth wash with selected demographic variables and.

CHAPTER-V
DISCUSSION

This chapter concentrates on the findings of this study derived from the statistical analysis and its pertinence to the objectives set for the study. The study has described the comparison between Chlorhexidine mouthwash and hydrogen peroxide to improve the oral health of bedridden patients admitted in Institute of Neurology Department at Rajiv Gandhi Government General Hospital, Chennai- 03.

Sixty patients between the age group of 21- >50 years, bedridden patients, with neuro problems were selected by Simple Random Sampling by lottery method, and assigned to Chlorhexidine and hydrogen Peroxide Group 30 each on the basis of inclusion criteria.

Semi structured interview / modified oral health assessment tool was used to gather information from the participants of both groups. Oral health of bedridden patients were assessed in both groups before intervention. Oral care was given by using Chlorhexidine mouthwash and Hydrogen Peroxide. After the post intervention oral health was assessed using modified oral health assessment tool. Data collection was done in one month duration from 29 August 2011 to 29 September 2011, with permission of Head of The Department and approval of Institutional Ethical Committee.

CHARACTERISTICS OF DEMOGRAPHIC VARIABLES

The demographic characteristics of 60 samples who participated in the study were 11 (36.7%) of samples were > 50yrs in the Chlorhexidine group where as in the Hydrogen Peroxide group 12 (40%) were the age group of >50 years. The distribution of sex showed that 28 (93.3%) samples were males in Chlorhexidine group and 25 (83.3%) samples were males in the Hydrogen peroxide group 12 (40%) of samples were having primary education in Chlorhexidine group, whereas in Hydrogen peroxide 10 (33.3%) were having primary education. Majority 12 (40.0%) of them had accidents in chlorhexidine group 14 (46.7%) of them had accidents in Hydrogen peroxide

group. Most of them were staying in the hospital between 11-15 days in Chlorhexidine 22(73.3%) and 15 (50.0%) in Hydrogen Peroxide group. Duration of illness was observed >5days in both group.

The first objective of the study was to assess the level of oral health of bedridden patients before the intervention for both the group of patients.

It represents the level of oral health before the intervention with chlorhexidine mouth wash and hydrogen peroxide solution. In chlorhexidine group after assessing the pretest level of oral health on the first day 27 (90.0%) samples had severe problems, 3(10%) of samples had moderate problem in the oral health and none of them(0.0%) had normal level of oral health. In hydrogen peroxide group,it is evident after assessing the pretest level of oral health on the first day 25(83.3%) samples had severe problems, 5(16.7%) of samples had moderate problems in the oral health and none of them (0.0%) had normal level of oral health.

The second objective of the study was to assess the effectiveness of chlorhexidine mouth wash to improve the oral health of bedridden patients.

It represents the level of oral health in the Chlorhexidine group. It is evident after assessing the pretest level of oral health on the first day 27(90.0%), 3(10.0%) of samples had moderate problems in the oral health samples had severe problems in the oral health and none of them had normal level of oral health. Whereas in the sixth day 5(16.7%) samples had normal level, 25(83.3%) of samples had mild level of oral problems and none of them had moderate and severe level problemsin the oral health.

The mean score of oral health on day one was 11.67 which got reduced to 2.40 on the sixth day in Chlorhexidine group which is a significant reduction. Due to chlorhexidine mouthwash the samples were able to observe a reduced score of 9.27 from baseline score of 11.67. The percentage of improvement in oral health was 57.9% which is statistically significant. Chlorhexidine is a chemical antiseptic. It has both bactericidal and bacteriostatic mechanisms of action. It has been shown to have an immediate

bactericidal action and a prolonged bacteriostatic action due to absorption onto the pellicle- coated enamel surface. It is leading prescription for oral rinse to fight gingivitis and bleeding. Since it has the both bactericidal and bacteriostatic action it prevents infection and also helps in improving the oral health of bedridden patients.

Becerik S et al conducted study on 'Antimicrobial effect of adjunctive use of chlorhexidine mouthrinse in untreated gingivitis: a randomized, placebo- controlled study. The aim of this study was to examine the effectiveness of chlohexidine mouthrinse. Chlorhexidine group rinsed with chlorhexidine mouth wash, while placebo group rinsed with placebo mouth rinse. In the chlorhexidine group the total bacteria count is significantly reduced in posterior teeth ($p<0.05$), while no significant decrease was observed in the placebo group ($p>0.05$). Chlorhexidine as an adjunct to daily plaque control could be used in the management of plaque associated gingivitis and in reducing the sub gingival total bacteria count especially in posterior teeth.

The third objective of the study was to assess the effectiveness of hydrogen peroxide solution to improve the oral health of bedridden patients:

It represents the level of oral health in the Chlorhexidine group. It is evident after assessing the level of oral health on the first day 25(83.3%) samples had severe problems, 5(16.7%) had moderate problems in the oral health and none of them 0.0% had mild and normal level of oral health. Whereas in the sixth day 24(80.0%) samples had moderate level of oral health,6(20.0%) of samples had mild level of problems and none of them had normal level and severe problems in oral health.

The mean score of oral health on day one were 11.60 which got reduced to 6.20 on the sixth the day which is significant. By using hydrogen peroxide solution samples were able to reduce the oral health assessment score to 5.4 score from baseline score of 11.60. The percentage of improvement in oral health was 33.8% which statistically significant. Bacteria is the root cause of all dental problems. Hydrogen peroxide kills bacteria on

teeth and along the gum line, preventing cavities, it also helps to improve the oral health of bedridden patients.

2011, Hossainian et al conducted study on 'The effects of Hydrogen peroxide mouthwashes on the prevention of plaque and gingival inflammation'. The purpose of this review was to describe systematically the effects of hydrogen peroxide mouth washes in the prevention of plaque accumulation and gingival inflammation. Descriptive comparisons were presented for hydrogen peroxide mouthwash as compared with control mouthwashes or no oral hygiene. This six month study showed a positive effect of the use of hydrogen peroxide on the modified gingival index. The results of the studies included in this review showed that hydrogen peroxide mouthwashes do not consistently prevent plaque accumulation when used as a short term mono therapy. When used as a long term adjunct to daily oral hygiene, the results of one study indicate that oxygenating mouthwashes reduce gingival redness.

The fourth objective is to compare the effectiveness of chlorhexidine mouthwash and hydrogen peroxide to improve the oral health of bedridden patient.

In pre test Chlorhexidine group patients were having 11.67 score and the post test Chlorhexidine group were having 2.40 score. In Chlorhexidine group patients observed reduction their score from 11.67 to 2.40, due to Chlorhexidine mouthwash they were able to reduce 9.27 score from baseline. This reduction is significant. Statistical significance was calculated by using Student's paired 't'test ($t=29.49, p=0.001, df=29$).

In pre test Hydrogen Peroxide group patients were having 11.60 score and post test Hydrogen peroxide group were having 6.20 score. In Hydrogen peroxide group patients saw reduction their score from 11.60 to 6.20. Due to Hydrogen peroxide they were able to reduce 5.4 score form baseline. This reduction was significant. Statistical significance was calculated by using Student's paired't' test ($t=21.83, p-0.001, df=29$).

When comparing the pre test Chlorhexidine group and Hydrogen peroxide group, the difference observed was 0.07 which is very small difference and insignificant. Statistical significance was calculated by using students independent‘t’ test (t=0.24,p=0.81,df=58 not significant).

When comparing the post test Chlorhexidine group and Hydrogen peroxide group the difference is 3.80 which is a large difference and significant. Statistical significance was caldulated by using Student's independent‘t’ test (t=11.56,p=0.001,df=58).

Hydrogen peroxide group patients saw reduction in their score from 11.60 to 6.20. Due to oral care with hydrogen peroxide they were able to reduce 5.40 score from baseline. Whereas, in Chlorhexidine group patients observed a reduction in their score from 11.67 to 2.40. Due to oral care with Chlorhexidine they were able to reduce 9.27 score from baseline score. The reduction score is higher in Chlorhexidine group (9.27) than Hydrogen peroxide group (5.40).

This shows the net benefit of this study which indicates the effectiveness of oral care with Chlorhexidine and hydrogen peroxide among bedridden patients. Therefore statistically the results suggest that there is indeed a difference in Chlorhexidine and hydrogen peroxide score level of oral health.

In Chorhexidine Group, patients observed a reduced score of 57.9% whereas in Hydrogen Peroxide patients saw a reduced score of 33.8% pain score. Difference is 24.1%. Chlorhexidine patients were benefited than hydrogen peroxide patients. Differences between pretest and posttest score was calculated using and mean difference with 95% CI and proportion with 95% CI

J N J Dent et al conducted study comparing hydrogen peroxide and chlorhexidine mouthwash in reducing gingival bleeding. The results indicate that the chlorhexidine mouthwash is useful in improving oral health, whereas hydrogen peroxide offered no advantages to conventional oral hygiene.

The fifth objective is to associate the effectiveness of Chlorhexidine mouthwash and Hydrogen peroxide with selected demographic variable.

Socio economics and demographic variables such as age, sex, religion, occupation, education, diet, marital status, cause of illness, length of hospital stay and duration of illness are associated with post level of oral health assessment score among Chlorhexidine and Hydrogen peroxide group. The association between demographic variable and their level of oral hygiene in Chlorhexidine group was the younger age (21-40), Pearson Chi-square/Yates corrected chi-square test shows $\chi 2=7.14, p=0.01, df=1$. In marital status (Unmarried) Chi-square test shows $\chi 2=6.01$, $p=0.23$, $df=1$, less duration of stay (<15days) Chi-square test shows $\chi 2=6.0$, $p=0.01$, $df=1$. These findings are in consistent with findings of the previous studies conducted various authors.

These findings reveals that younger, unmarried and less duration of stay have normal level of oral health. In hydrogen peroxide group there exists no association between normal level of oral health score and these demographic variables. Since they were less significant than Chlorhexidine.

Therefore statistically the results suggest that there is association between the demographic character bedridden patients and oral health after Chlorhexidine mouthwash.

CHAPTER-VI
SUMMARY, RECOMMENDATIONS

6.1 SUMMARY OF THE STUDY

The purpose of the study was a comparative study between Chlorhexidine mouthwash and Hydrogen peroxide to improve the oral health of bedridden patients admitted in the Institute of Neurology Department at Rajiv Gandhi Government General Hospital, Chennai-03.

The goal is to have smooth teeth so plaque and tartar can not cling to their teeth thus limiting bacteria growth. It is, however, impossible to remove this calculus, it must be removed by dentist or a hygienist.

For this persistent cause of bleeding a mouth rinse called Periogard can be professionally prescribed. It is the most effective mouth rinse for removing plaque and fighting gingivitis. It has a solution of Chlorhexidine that controls the growth and kills the bacteria that is causing gum disease.

Objectives of the study were

- To assess the level of oral health of bedridden patiens before intervention for both the group of patients
- To assess the effectiveness of Chlorhexidine mouthwash to improve the oral health of bedridden patients.
- To assess the effectiveness of hydrogen peroxide to improve the oral health of bedridden patients.
- To compare the effectiveness of chlorhexidine mouthwash and hydrogen peroxide to improve the oral health of bedridden patients.
- To associate the effectiveness of chlorhexidine mouthwash, and hydrogen peroxide with selected demographic variables.

REVIEW OF LITERATURE

The review was done to understand the extent of importance of oral health and to know the effectiveness of chlorhexidine and hydrogen peroxide to improve the oral health of bedridden patients.

METHODOLOGY OF THE STUDY

Quantitative approach , true experimental design, sample size is 60, 30 in chlorhexidine groups, 30 in control group; selected by simple random sampling technique by lottery method from the sample frame within inclusion criteria.

Data was collected by semi structured interview/observation schedule for demographic profile of the bedridden patients, and structured oral health assessment tool was to collect information on oral health. Descriptive statistics (percentage) and inferential statistical (Pearson Chi square test, Student's independent't' test and Student's paired't' test) were used to analyze the findings of the study from the quantitative data.

The study was carried out in Neurology Department of Rajiv Gandhi Government General hospital, Chennai-03 for one month duration from 29 August 2011 to 29 September with permission of head of the department and ethical committee approval. Informed consent obtained from the participants and information about the study was given to them.

Pilot study was conducted to find out the feasibility of conducting study and refinement of tools.

Major findings of the study

- The results showed that there was a significant difference between chlorhexidine group and hydrogen peroxide group.

- Majority of the samples were belongs to age group > 50years in both chlorhexidine(36.7%) and hydrogen peroxide(40.0%) group.

- Majority of the samples were male in chlorhexidine group(93.3%) and hydrogen peroxide (83.3%).

- Majority (40.0%) of samples have completed primary education in chlorhexidine group and in hydrogen peroxide group(36.7%) samples were completed higher secondary education.

- Majority (80.0%) of the samples belongs to Hindu religion in chlorhexidine group and (76.6%) of them belong to hydrogen peroxide group.

- Majority of the cause of illness was accident in both the chlorhexidine(40.0%) group and (46.7%) in hydrogen peroxide group.

- Majority (73.3%) of the samples stayed in hospital between 11-15 days in chlorhexidine group and (50.0%) in hydrogen peroxide group.

- Duration of illness was more than 5 days (100%) in both the chlorhexidine and hydrogen peroxide groups.

- In chlorhexidine group the pre test oral health assessment score was 11.67 which reduced to 2.40 in the post test. The difference was 9.27. It represents there is a significant improvement of oral health by using chlorhexidine mouthwash for bedridden patients (p=0.001) (table 6).

- In hydrogen peroxide group the pre test oral health assessment score was 11.60 which reduced to 6.20 in the post test. The difference was 5.4. It represents there is a significant improvementoral health by usinf hydrogen peroxide solution for bedridden patients (p=0.001) table(9).

- In Chlorhexidine Group, patients saw reduced score of 57.9%, whereas in Hydrogen Peroxide patients are saw reduced score of 33.8% in pain. Difference is 24.1%. Chlorhexidine patients were benefited than Hydrogen Peroxide patients. There was a significant difference between Chlorhexidine and Hydrogen peroxide group in all aspects

except the dentures in improving the oral health of bedridden patient (p=0.001) (table 13)

- There was a significant association between demographic variable of less duration of stay and improvement of oral health in Chlorhexidine group (p=0.01) (table 14)

6.2 CONCLUSIONS

Oral health of bedridden patients with neurological problems leads to complications to some degree. As the disease progresses the problem related to oral health also increases which in turn affect the comfort of life of the patients both physically and mentally. As the duration of illness increases the disease progression also increases. Mouthwash with chlorhexidine can be carried out by the patient or the relatives in their home and is economical. Since the prognosis of the neuro disease is delayed, chlorhexidine mouth wash improve the oral health of bedridden patient and prevent oral complications and promotes comfort of the patient.

6.3 IMPLICATIONS

The study has implications, guidelines and suggestions for nursing practice, nursing education, nursing administration and nursing research.

NURSING PRACTICE

- The study results will help the nursing personnel to understand the importance of oral health among bedridden patient.

- Nurses can motivate the patients to follow the proper oral care to prevent oral complications.

- Nurses can emphasise on the use of mouthwash to prevent the plaque bleeding from the gums and improve the comfort of the patient.

- Nurses can provide education to patient to use various treatments available.

NURSING EDUCATION

Nurse educators should teach the students and include in syllabus about

- Importance of oral care among bedridden patients
- Develop different tools to assess the oral health.
- Scoring tools to assess the oral health.
- Impart health education measures and component of health education.
- Lifestyle modification needed to prevent or control disease progression and disability status.

NURSING ADMINISTRATION

- Nursing administrators should organise to educate the public to create awareness on the complications of poor oral health hygiene.
- Organize In-Service Education programme for nursing personnel to update their knowledge.
- Encourage research activities of nurses in these areas.

NURSING RESEARCH

- The study will be valuable reference material for future researchers.
- The findings of this study would help to expand scientific body of professional knowledge upon which further researchers can be conducted.
- Study can be conducted in a large scale level in consideration of other contributing variables.

6.4 RECOMMENDATIONS

- A similar study can be replicated on a large scale basis.
- Study can be conducted on various aspects such as oral health, mobility, performance of daily living activities.
- Study can be done for longer duration
- A study can be conducted to assess the effectiveness of structured teaching programme on various therapeutic modalities.
- A study can be conducted to compare the Chlorhexidine and other commercial mouthwash solutions.
- Effectiveness of different therapeutic measures can be compared.

LIMITATION

The present study has following limitations

- Difficulty faced in regular attendance of study samples for therapy.

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LIST OF ABBREVIATIONS

S.No	ABBREVIATIONS	EXPANSION
1.	CHX	Chlorhexidine
2.	VAP	Ventilator Associated Pneumonia
3.	SRP	Scaling and Root Planning
4.	PACS	The Prevention of Adult Caries Study
5.	ICU	Intensive Care Unit
6.	EO	Essential Oil
7.	CPIS	Clinical Pulmonary Infection Score
8.	H2O2	Hydrogen Peroxide
9.	S. Mutans	Streptococcus Mutans
10.	HAP	Hospital Acquired Pneumonia

PROCEDURE OF ORAL CARE

INTRODUCTION:

Oral hygiene means brushing the client's teeth or cleaning the dentures according to the client's usual routine. Oral hygiene is provided to maintain the integrity of the client's teeth, gums, mucus membrane and lips.

ARTICLES

- Small bowl
- Face towel
- Gloves
- Gauze pieces
- Artery forceps
- Dissecting forceps
- Mouth wash solution(chlorhexidine , hydrogen peroxide)
- Tongue depressor
- Kidney tray

PREPARATION OF THE MOUTH WASH SOLUTION

- 5ml chlorhexidine mouth wash+ 5ml sterile water
- 5ml hydrogen peroxide + 5ml sterile water

STEPS OF PROCEDURE

- Wash hands
- Prepare the solution for the mouthwash
- Place the kidney tray close to the cheek

- Take a gauze piece , wrap it around the forceps, covering the tips completely.
- Moisten the gauze piece and dip it in the mouth wash solution, swab each teeth gently but firmly, taking to clean all sides of teeth.
- Clean the inner and chewing surfaces of the teeth.
- With the tongue depressor clean the tongue, using the gauze covered artery forceps.
- Thorough cleaning of the teeth and tongue is ensured by repeating each stroke and on each area.
- When the teeth and tongue are cleaned well, stop the procedure, wipe the lips and face with the towel.

AFTER CARE

- Remove the kidney tray, and towel
- Make the client comfortable
- Tidy up the unit
- Replace the articles
- Wash the hands
- Record if any abnormality observed.

APPENDIX

STUDY TOOL

Section- A :DEMOGRAPHIC DATA

1. Age

a. 21 - 30 years

b. 31 - 40 years

c. 41 - 50 years

d. More than 50 years

2. Sex

a.Male

b.Female

3. Religion

a. Hindu

b. Muslim

c. Christian

d. Others

4. Occupation

a. Government

b. Private

c. Business

d. unemployee

5. Educational status

a. Uneducated

b. Primary education

c. Higher secondary

d. Graduate

6. Diet pattern

    a. Vegetarian

    b. Non vegetarian

7. Marietal status

    a. Married

    b. unmarried

8. Cause of illness

    a. Accident

    b. Infection

    c. Systemic illness

    d. Idiopathic

9. Length of hospital stay

    a. <5 days

b. 5-10 days

c. 11-15 days

d. > 15 days

10. Duration of illness

a. >1days

b. 2-3 days

c. 4-5 days

d. >5 days

SECTION- B

ORAL HEALTH ASSESSMEMT TOOL

Sl.No	*Characteristics*	*score*	*DAY I*	*DAY VII*
1.	**LIPS** a) Smooth,pink,moist b) Dry, chapped or red at corners c) Sweeling or lump white/red ulcerated patch;bleeding/ulcerated at corners	0 1 2		
2.	**TONGUE** a) Normal, moist roughness,pink b) Patchy,fissured,red,coated c) Patch that is red and ulcerated or swollen	0 1 2		
3.	**GUMS AND TISSUES** a) Pink,moist,smooth,no bleeding b) Dry, shiny , rough,red,swollen,one ulcer/sore spot under dentures c) Swollen, bleeding,ulcers ulcers, white/red patches, generalized redness under dentures	0 1 2		

4.	**SALIVA** a) Moist tissues, watery and free flowing saliva b) Dry, sticky tissues, little saliva present resident thinks they have a dry mouth c) Tissues parched and very swollen tissues parched and red very little saliva preset, saliva is thick, resident thinks they have a dry mouth	0 1 2		
5.	**NATURAL TEETH (YES/ NO)** a) No decayed or broken teeth/ roots b) 1-3 decayed or broken teeth/ roots or very worn down teeth c) 4 + decayed or broken teeth/roots or very worn down teeth, or less than 4 teeth,	0 1 2		
6.	**DENTURES (YES/NO)** a) No broken areas pr teeth, dentures regularly worn and named b) 1 broken area/tooth or dentures only worn for 1-2 hours daily, or dentures not named, or loose c) More than 1 broken teeth/ roots or very worn down teeth or less than 4 teeth	0 1 2		

7.	**ORAL CLEANLINESS** a) Clean and no food particles or tartar in mouth or dentures b) Food particles / tartar/ plaque in 1-2 areas of the mouth or on small area of dentures or halitosis(bad breath). c) Food particles tatar/ plaque in most areas of the mouth or on most dentures or severe halitosis(bad breath)	0 1 2		
8.	**DENTAL PAIN** a) No behavioural , verbal or physical signs of dental pain b) Are verbal and or behavioural signs of pain such as pulling at face, chewing lips, not eating, aggression. c) Are physical pain signs(swelling of cheek or gum, broken teeth, ulcers), as well as verbal and /or behaviouural signs(pulling at face not eating, aggression)	0 1 2		

Interpretation of score:

0- Normal 1-5 –Mild 6-10 - Moderate 11-16 - Severe

நேர்முக காணல் படிவம்

பகுதி I

புள்ளி விவர ஆய்வு

1) வயது

- அ) 21-30 வயது வரை ☐
- ஆ) 31-40 வயது வரை ☐
- இ) 41-50 வயது வரை ☐
- ஈ) 50 வயது மேல் ☐

2) பாலினம்

- அ) ஆண் ☐
- ஆ) பெண் ☐

3) மதம்

- அ) இந்து ☐
- ஆ) முஸ்லிம் ☐
- இ) கிருஸ்துவம் ☐
- ஈ) மற்றவை ☐

4) தொழில்

- அ) அரசாங்க வேலை ☐
- ஆ) தனியார் வேலை ☐
- இ) வியாபாரம் ☐
- ஈ) வேலை இல்லாதவர் ☐

5) கல்வித் தகுதி

- அ) படிப்பறிவு இல்லாதவர் ☐
- ஆ) ஆரம்பக் கல்வி ☐
- இ) மேல்நிலைக் கல்வி ☐
- ஈ) பட்டதாரி ☐

6) உணவுப் பழக்கம்

அ) சைவம் ☐

ஆ) அசைவம் ☐

7) திருமணம் பற்றிய விபரம்

அ) திருமணமானவர் ☐

ஆ) திருமணமாகாதவர் ☐

8) நோய் ஏற்பட்டதற்கான காரணம்

அ) விபத்து ☐

ஆ) நோய்தொற்று ☐

இ) உடல்மண்டல நோய் ☐

ஈ) காரணம் தெரியாது ☐

9) மருத்துவமனையில் இருந்த நாட்கள்

அ) 5 நாள்களுக்குள் ☐

ஆ) 5-10 நாட்கள் ☐

இ) 11-15 நாட்கள் ☐

ஈ) 15 நாட்களுக்கு மேல் ☐

10) நோயின கால அளவு

அ) 1 நாளுக்கு குறைவு ☐

ஆ) 2-3 நாட்கள் ☐

இ) 4-5 நாட்கள் ☐

ஈ) 5 நாட்களுக்கு மேல் ☐